

STRUCTURE OF THE MICROCARD (BASIC INSTRUCTIONS)

A02 = How to use the microcard		1	2	3		4
A01 = Structure of microcard				SIS		
B01 = Trouble-shooting chart	-A-	***X*	X*XXX	XXXXX	XXXXX	*XXXX X
	-B-	*XXXX	XXXXX	XXXXX	XXXXX	XXXXX XXX
	-C-	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX XXX
	-D-	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX XXX
	-E-	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX XX
	-F-	XXXXX	XXXXX	XXXXX	XXX	
	-G-	XXXXX	XXXXX	XXXX		
	-H-					
	-J-					
	-K-					
	-L-					
	-M-					
N01 = Service Information	-N-	*XXXX	XXXXX	XXXXX	XXX	XX XX*
		12345	67890	12345	67890	12345 678
			1		2	

- Index
- N28 = Table of contents and publication information
- 1 = Special features
 - 2 = Safety and precautionary measures
 - 3 = Test equipment and tools
 - 4 = Installation position of components

- a. Read from left to right.
- b. Title of micropicture (appears on each coordinate).

E16	Product/component/test step	
	Coordinate	

c. Limits of section

<u>==></u>	<u><==</u>	<u><==</u>	<u>=> <=</u>
Beginning	Mid-section	End	One-page section
A01			<= =>

HOW TO USE THE MICROCARD

Trouble-shooting instructions : PKW-045

System : EZ-K

Descriptions, photos, terminal designations and special features refer to the vehicle Peugeot 505 V 6, from 11. 86 with engine ZN 3 J.

The basic instructions are detailed trouble-shooting instructions. They must not be used as vehicle-specific instructions.

CAUTION: descriptions and photos may differ from the vehicle-specific brief instructions. Binding test specifications, terminal assignments and special features should be taken from the vehicle-specific brief instructions only.

For brief instructions, see microcard KFZ-00..

A02		<= =>
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SPECIAL FEATURES

The EZ-K ignition system installed in this vehicle operates, owing to the vee-type engine, with two knock sensors.

To be able to associate knocking with the respective bank of cylinders, the knock sensors are switched over as appropriate by the EZ-K control unit.

Incorrect indication of engine speed, dwell angle and ignition timing

In ignition systems with trigger box 0 227 100 124 (with current limitation) there may be an incorrect indication of engine speed, dwell angle and ignition timing on testers.

For more details, see Coordinates N15...N22.

SAFETY AND PRECAUTIONARY MEASURES

Always observe safety and precautionary measures in order to avoid hazards to persons and damage to the engine, the trigger box and control unit, and the ignition system.

CAUTION!

High-performance ignition system with dangerous high and low voltages!

Contact with voltage-carrying parts or terminals can be fatal (on both primary and secondary sides).

In this connection it must be noted that when working on or testing the ignition system the VDE requirements, in particular VDE 0104/7.67, or the pertinent local regulations outside Germany, must be complied with.

When working on the ignition system, the ignition must always be switched off (disconnect ignition or voltage source).
Such work includes:

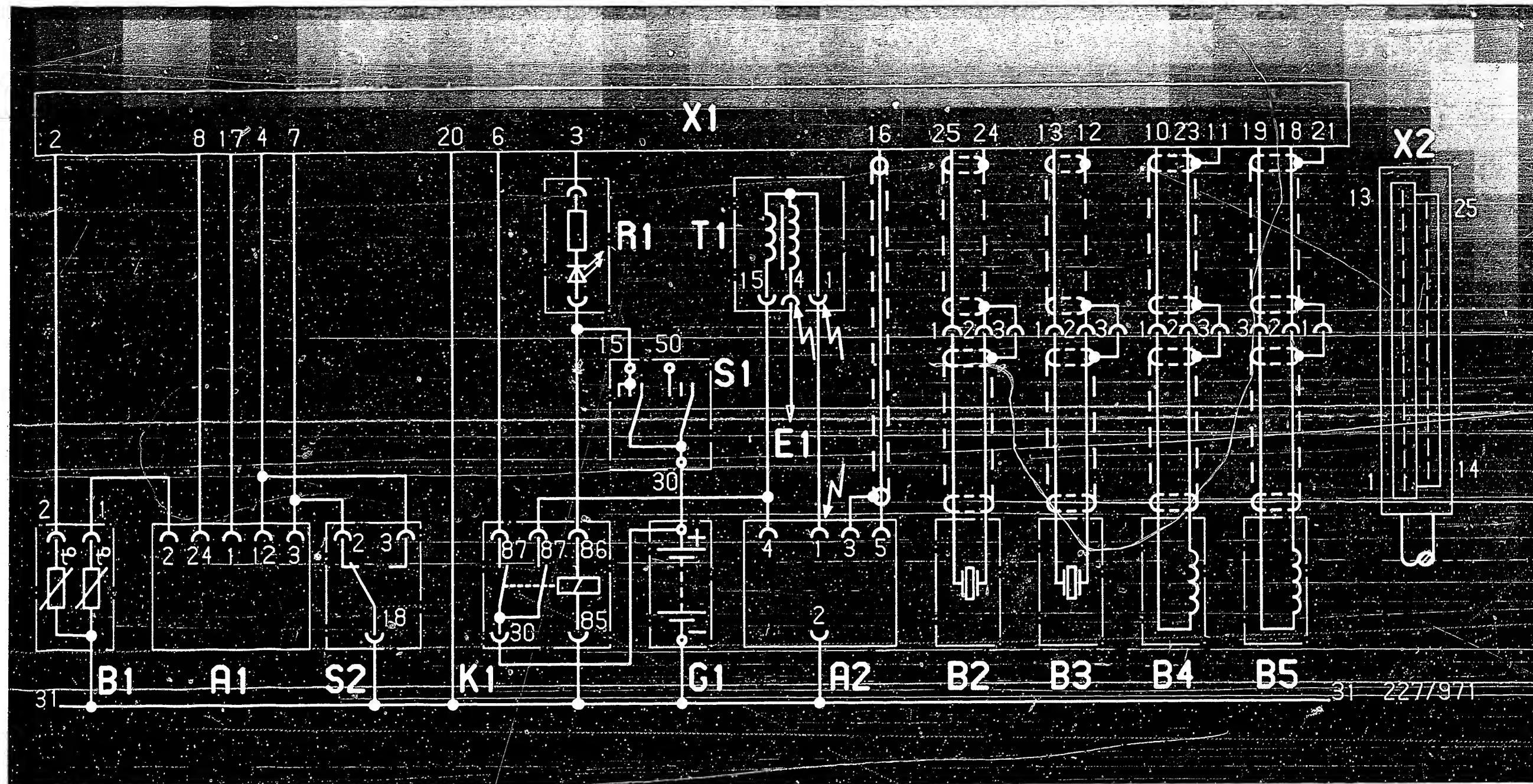
- * Connecting engine testing devices (timing light, dwell-tach tester, ignition oscilloscope, etc.).
- * Replacing parts of the ignition system (spark plug, ignition coil, ignition distributor, ignition cable, etc.).

SAFETY AND PRECAUTIONARY MEASURES
(Continued)

If during testing of the ignition system or adjustments to the engine (e.g. mixture preparation) it becomes necessary to switch on the ignition (connect ignition or voltage source), the dangerous voltages mentioned occur throughout the entire system.

In other words, the danger of accident exists not only at the individual parts of the ignition system, such as ignition distributor, ignition coil, trigger box, ignition harness), but also in the wiring harness (such as tachometer connection, diagnostic plug), in plug connections, and with test equipment.

For production reasons:
continued on the following
coordinate.



Danger arrows = dangerous voltages (400 V - 25 kV)

A1 = LH-Jetronic control unit

A2 = Trigger box

B1 = Coolant-temperature sensor

B2 = Knock sensor 2 (cylinders 4-5-6)

B3 = Knock sensor 1 (cylinders 1-2-3)

B4 = Engine-speed sensor

B5 = Inductive pickup - cylinder 1

E1 = to high voltage distributor

G1 = Battery

K1 = Power-supply relay

R1 = Fault lamp with series resistor

S1 = Ignition/starting switch

S2 = Throttle-valve switch

T1 = Ignition coil

X1 = EZ-K control-unit plug

X2 = EZ-K control-unit connector

The dangerous locations are identified by danger arrows taking the example of the terminal diagram of an electronic ignition system.

SAFETY AND PRECAUTIONARY MEASURES (continued)

Never start engine without battery being firmly connected (battery terminals bolted tight). Do not disconnect battery from the vehicle electrical system with the engine running.

Do not use a fast charger for starting the engine.

Render starting assistance only with a second 12 V battery and jumper cables.

Caution! Due to non-uniform requirements placed by vehicle manufacturers on electronic products, we do not recommend the use of 24 V batteries for starting assistance.

When charging the battery in the vehicle or rendering starting assistance, observe the directions given in the operating instructions of the fast charger as well as those provided by the vehicle manufacturer.

Prior to charging or fast-charging the battery, disconnect it from the vehicle electrical system.

Incorrect polarity of the supply voltage, e.g. due to incorrect connection of the battery or ignition coil, can lead to irreparable damage to a control unit.

Do not connect or disconnect the wiring harness from control units or trigger-box with the ignition switched on.

Prior to exposure to temperatures above +80°C (paint-dry installation) remove control units.

Control units must be removed before electric spot welding.

SAFETY AND PRECAUTIONARY MEASURES (continued)

- * Carry out resistance measurements only with the ignition switched off or the battery disconnected (defective tester).
- * When carrying out compression testing, disconnect the trigger-box plug, or connect ignition coil term. 4 firmly to ground using auxiliary cable (dangerous high voltage, insulation damage to ignition coil, high-voltage distributor, ignition harness).

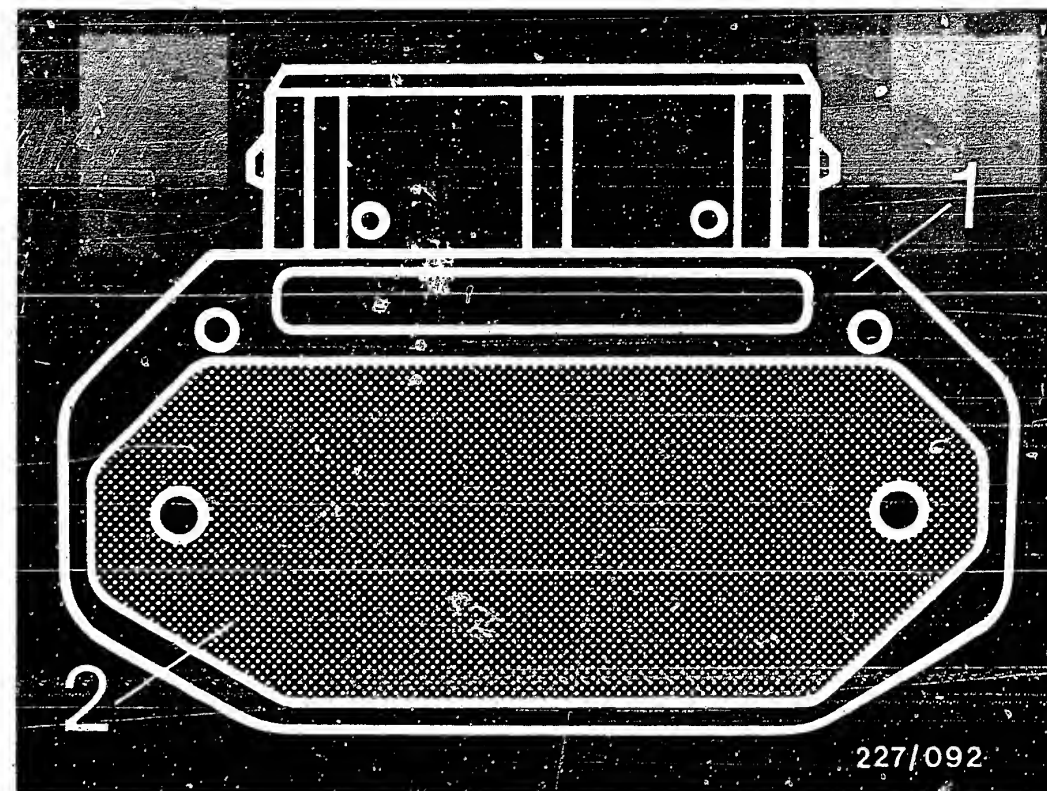
N o t e:

Auxiliary cable must be interference-suppressed to at least 2 k Ω , e.g. sleeve-type suppressor (5 k Ω) 0 356 500 001.

- * The specified ignition coil (see part no.) may not be replaced by a different ignition coil.
- * A suppression capacitor must not be connected to ignition coil term. 1.
- * Ignition coil term. 1 must not be connected to ground for the purpose of theft prevention. (Ignition coil would be destroyed when "ignition on".)
- * Battery + or a test lamp must never be connected to ignition coil term. 1 (would destroy trigger box).
- * The ignition cable from ignition coil term. 4 to high-voltage distributor term. 4 must never be disconnected during operation.
- * There must never be voltage jumps from ignition coil term. 4 to ignition coil terms. 1 and 15, as this could destroy the trigger box.

SAFETY AND PRECAUTIONARY MEASURES (Continued)

- * Install exclusively specified, radio-interference-suppressed spark plugs; otherwise malfunctioning of control unit.
- * Standard resistance ignition cables must not be replaced by conventional ignition cables, otherwise malfunctioning of control unit.
- * Knock-sensor connecting leads must not be mixed up.
(Knocking will not be detected, engine may be destroyed).
- * Lead from inductive pickup - cylinder 1 - must be laid separate from the high-voltage cables of other cylinders; otherwise malfunction of control unit.
- * To prevent irreparable damage to the trigger box, the secondary side of the ignition system must have at least $2\text{ k } \Omega$ interference suppression; the original distributor rotor with $1\text{ k } \Omega$ must be installed (even in the case of radio and spark interference suppression, do not use a $5\text{ k } \Omega$ distributor rotor).
- * Leads from engine-speed sensor to EZ-K control unit and from trigger box to EZ-K control unit must be shielded (malfunction of control unit).
- * Arcing and breakdown at high-voltage distributor cap (poor insulation) may destroy control unit and trigger box.



1 = Trigger box

2 = Base plate

SAFETY AND PRECAUTIONARY MEASURES (Continued)

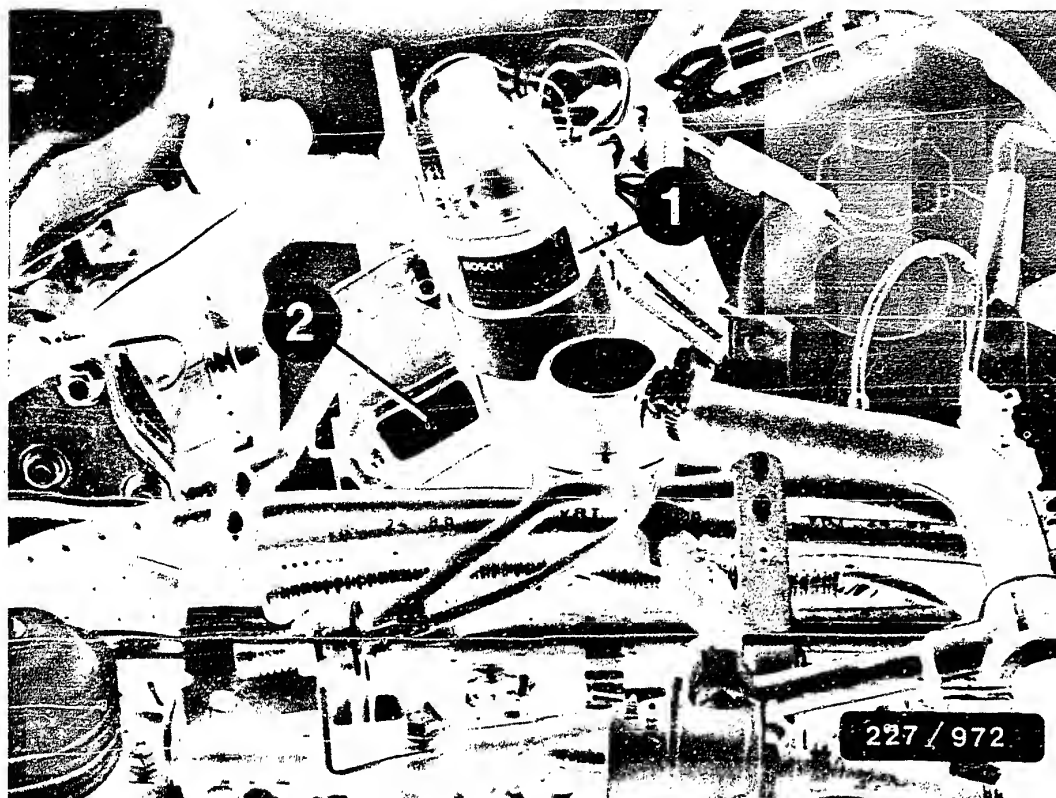
- * Before mounting on the ignition distributor, coat base plate of trigger box (picture) with thermal-conduction paste.
- * Apply thermal-conduction paste with suitable object (screwdriver, matchstick etc). Do not bring thermal-conduction paste into contact with painted parts.

SAFETY AND PRECAUTIONARY MEASURES (Continued)

- * EZ-K control unit, trigger box and ignition coil will be destroyed in case of incorrect polarity of battery.
- * Knock-sensor leads must be shielded and laid separate from high-voltage cables.
- * Mount fastening screw of knock sensors without washer, spring lock washer, tooth lock washer etc. Secure fastening screw with locking paint only.

NECESSARY TEST EQUIPMENT AND AUXILIARIES

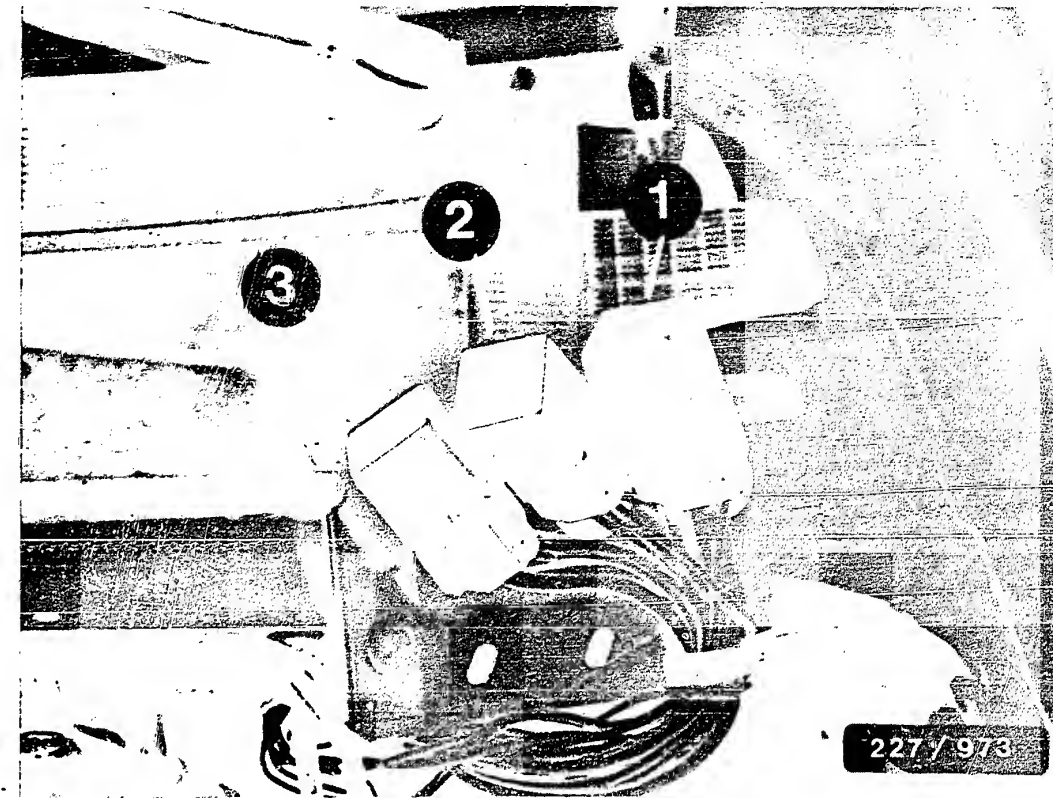
Motortester e.g.	MOT 201	0 684 000 201
Pulse shaper (for measuring primary voltage with MOT 201,202,400)		1 684 463 154
Ohmmeter or e.g.	ETE 014.00 Pontavi WH2	0 684 101 400 commercially available
Voltmeter e.g.	ETE 014.00	0 684 101 400
Thermal-conduction paste		5 942 860 003
Test leads (for correct connection of test equipment at connectors).	and KDZS 0004 KDZS 0005	
Test prods	red black	1 684 485 035 1 684 485 034
(for correct connection of test equipment at connectors).		
Screw-locking paint	30 g	5 703 245 003
Torque wrench Range 5 ... 60 Nm		commercially available
Auxiliary cable for user- fabrication (for jumping of power-supply relay) Necessary parts: approx. 150 mm cable 3 blade terminals		2.5 mm ² 8 784 480 011



- 1 = Ignition coil
- 2 = Trigger box with heat sink

INSTALLATION POSITION OF COMPONENTS

The trigger box and the ignition coil are mounted on a common heat sink and are accommodated in the engine compartment on the left-hand side as viewed in the forward direction of travel.



- 1 = Ignition power-supply relay
- 2 = LH-Jetronic main relay
- 3 = Fuel-pump relay

INSTALLATION POSITION OF COMPONENTS (continued)

INSTALLATION POSITION OF COMPONENTS (continued)

The pulse generator for cylinder-1 detection is slipped onto the ignition cable of cylinder 1, see arrow in top picture.

The coolant-temperature sensor is on the engine at the front, on the thermostat housing, see arrow in center picture.

The engine-speed sensor is on the engine at the rear, on the clutch housing, see arrow in bottom picture.



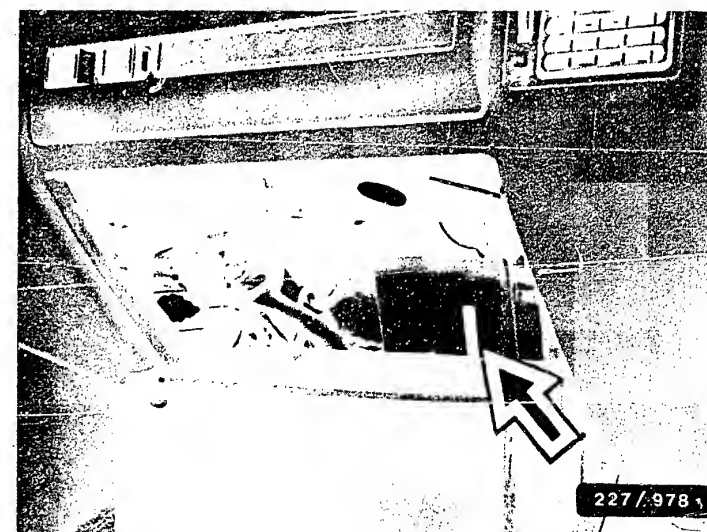
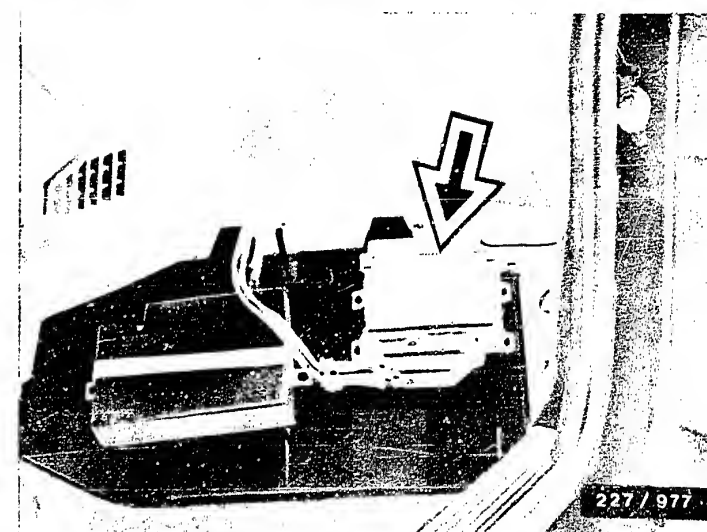
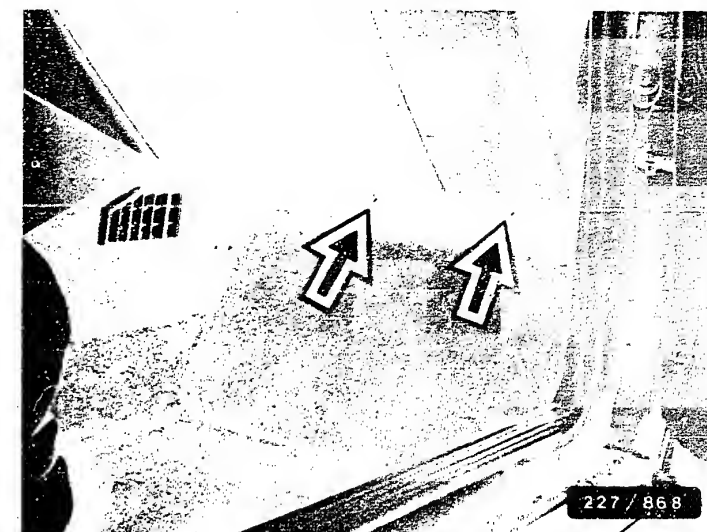
INSTALLATION POSITION OF COMPONENTS (continued)

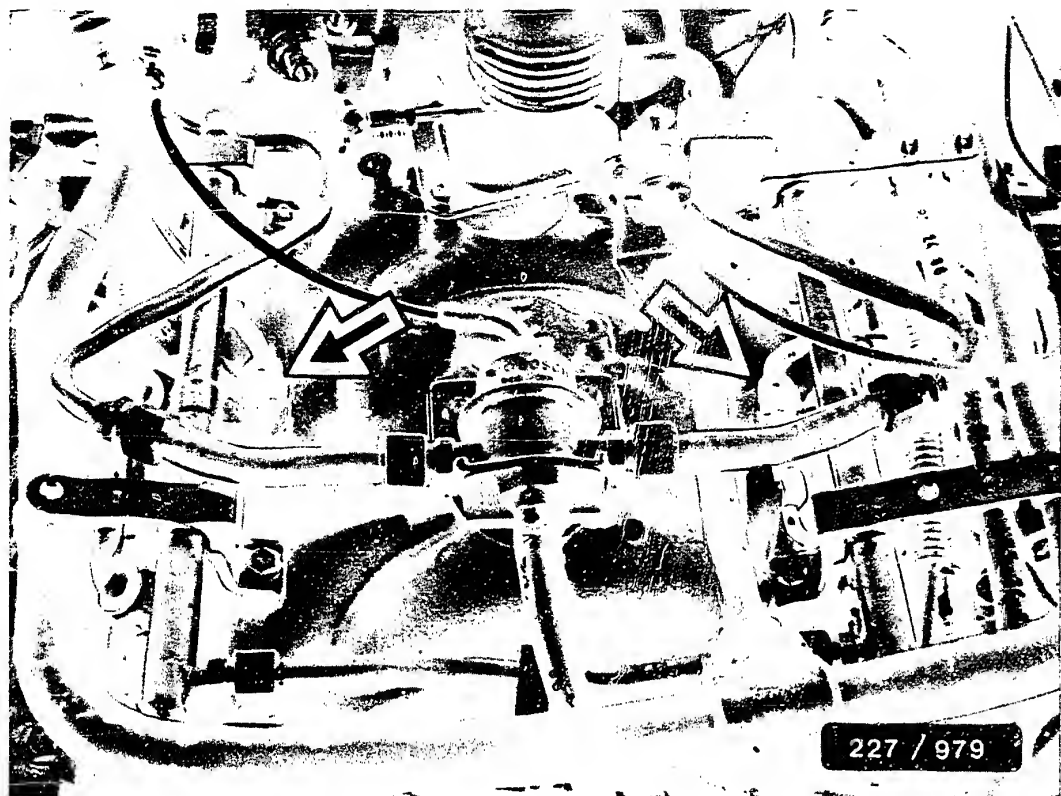
The EZ-K control unit is in the front-passenger footwell under a floor plate, see arrow in center picture.

How to remove:

Loosen two nuts on the upper edge of the floor plate and take off floor plate, see arrows in top picture.

The LH-Jetronic control unit is behind the glove box, see arrow in bottom picture.





Arrows = knock-sensor plug-in connections

The knock sensors are under the intake manifold on the engine block (not visible in picture).

How to remove:

Remove fuel lines, electric leads, injection valves and intake manifold.

Mount fastening screw of knock sensor without washer, spring lock washer, tooth lock washer etc.

Tightening torque 15 ... 25 Nm

Lock fastening screw with locking paint only.

For production reasons:
continued on the following
coordinate.

INSTALLATION POSITION OF COMPONENTS (continued)

Fault Lamp (1) including protective resistor are in the instrument panel (top picture).

How to remove:

Remove steering wheel (wheels straight ahead).

Introduce thin screwdriver consecutively into the two holes in the instrument panel (top picture, arrows).

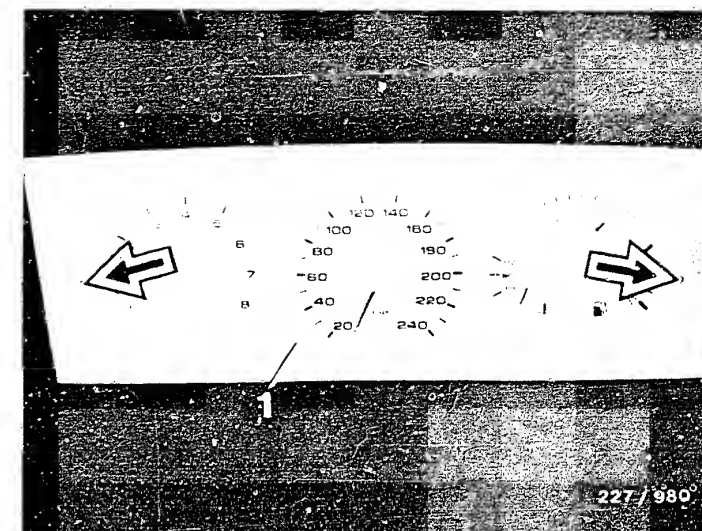
Instrument panel is unlatched by pressing lightly on the screwdrivers.

Pull instrument panel out of installation opening (speedometer shaft has latching connection).

Remove socket of fault lamp (1) (see bottom picture).

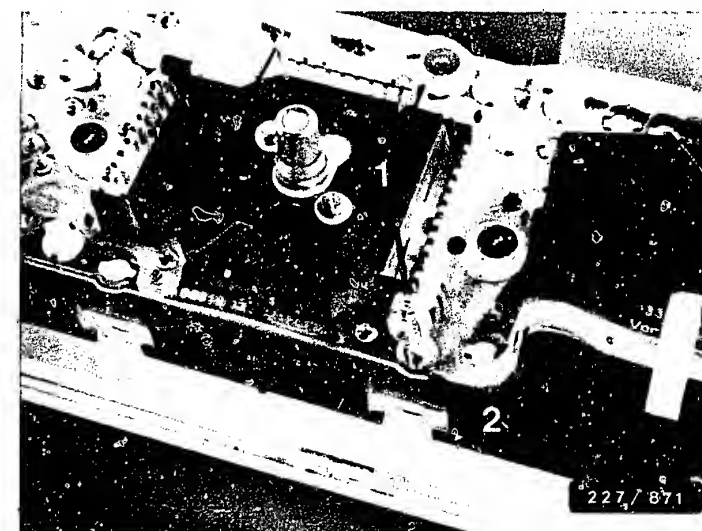
Installation of fault lamp:

Marked by a large recess on the lower part of the printed-circuit board for leading through the protective resistor (2) (see bottom picture).



1 = Fault lamp

1 = Socket of fault lamp
2 = Protective resistor



HOW TO USE TROUBLE-SHOOTING CHART AND TROUBLE-SHOOTING PROGRAM

The TROUBLE-SHOOTING CHART starts on coordinate B03 and contains customer complaints (fault symptoms) with several possible causes (component faults) in each case as well as coordinate references for detailed trouble-shooting. If no coordinate reference is given, this is a cause for which no test instructions are required.

If, after checking all the possible causes, the customer complaint has still not yet been rectified, then TRY installing a new specified coil or trigger box/control unit.

HOW TO USE TROUBLE-SHOOTING CHART AND TROUBLE-SHOOTING PROGRAM (continued)

The TROUBLE-SHOOTING PROGRAM contains all system and component checks mentioned in the trouble-shooting chart. It is divided into three rows of boxes.

The left-hand column contains test instructions and set values.
The center column contains instructions on trouble-shooting and fault rectification.
The right-hand column contains the illustrations/terminal diagrams belonging to the text, with explanations.

If the questions in the left-hand column can be answered conclusively with "yes", continue trouble-shooting with the next box down.

If the answer to the question is "no", branch to the center column and carry out the tests in the order given there.
After rectifying a fault repeat the test as a check.

- Battery fully charged
- Engine in good mechanical condition
(e.g. compression, valve clearance etc.)
- Engine at operating temperature, approx. +80°C
(where necessary)
- Proper seating of all plug connections of
wiring harness

Customer complaint (fault symptom)

1. Starting motor operates, engine fails to start or starts only with great difficulty.
2. Engine starts but then dies.
3. Idle problems (engine speed, exhaust gas).
4. Poor throttle take-up, flat spot during acceleration.
5. Engine missing (ignition, injection).
6. Maximum engine power/top speed not reached.
7. Fuel consumption too high.
8. Engine running on (dieseling).
9. Engine knocking/pinging.
10. Engine overheating.
11. Fault lamp.

										Cause (component fault)	Coord.
									*	Self-diagnosis	B06
*		*	*	*						High-tension side	B25
*		*	*	*						Ignition coil	B27
*										Firing sequence	—
*										Trigger-box voltage	C01
*										Primary-circuit voltage	C03
*										EZ-K control-unit voltage	C05
*										Engine-speed sensor	C07
*										EZ-K control-unit operation	C13
*										Engine-speed signal (Jetronic)	C15
*				*						Contact resistances	C17

TROUBLE-SHOOTING CHART (CONTINUED)

Customer complaint (fault symptom)

1. Starting motor operates, engine fails to start or starts only with great difficulty.
2. Engine starts but then dies.
3. Idle problems (engine speed, exhaust gas).
4. Poor throttle take-up, flat spot during acceleration.
5. Engine missing (ignition, injection).
6. Maximum engine power/top speed not reached.
7. Fuel consumption too high.
8. Engine running on (dieseling).
9. Engine knocking/pinging.
10. Engine overheating.
11. Fault lamp.

Cause (component fault)										Coord.	
*	*		*	*						Idle throttle-valve switch	C19
				*		*				Full-load throttle-valve switch	C21
								*		Fault lamp	C23
*	*		*	*		*	*	*		Spark-advance angle	C27
			*							EZ-K control-unit voltage	D03
			*							Trigger-box voltage	D01
			*							Ignition-coil voltage	D05
			*							Primary voltage	D09

USE OF SELF-DIAGNOSIS, SELF-DIAGNOSIS TEST TABLE, AND SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM

The control unit installed in this vehicle incorporates self-diagnosis. For this reason, trouble-shooting must start with self-diagnosis.

Activation of self-diagnosis is described starting on Co-ordinate B09. The self-diagnosis test table starting on B11 includes:

- Fault indication (flashing code)
- Components or system functions inspected
- Test instructions/conditions
- Connection terminals
- Set-value information
- Co-ordinate information for trouble-shooting and elimination in the subsequent self-diagnosis trouble-shooting program.

USING THE SELF-DIAGNOSIS, SELF-DIAGNOSIS
TEST TABLE AND SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM
(Continued)

The self-diagnosis trouble-shooting program is divided into three columns starting at Coordinate B13.

The left-hand column contains test instructions and set values.

The center column contains information on trouble-shooting and on how to rectify the fault.

The right-hand column contains the illustrations/terminal diagrams belonging to the text, together with explanations.

If the questions in the left-hand column can be answered conclusively with "yes", continue trouble-shooting with the next box down.

If the answer to the question is "no", branch to the center column and carry out the tests in the order given there.

After rectifying a fault, repeat the test as a check.

If the self-diagnosis indicates a fault, but no system fault or component fault was found during trouble-shooting, try replacing the control unit.

If no more fault is indicated in self-diagnosis and the customer complaint has still not been eliminated (symptom of trouble), continue trouble-shooting with the trouble-shooting chart starting at Coordinate B25.

For production reasons:
continued on the following
coordinate.

SELF-DIAGNOSIS

General

The EZ-K control unit has a self-diagnosis feature in the form of a flashing code. With this self-diagnosis, there is always only one fault indicated. If there is more than one fault, the fault with the higher priority is indicated. To be able to ascertain further faults, the first-detected fault must be rectified.

Fault lamp

Fault lamp in instrument panel lights up after ignition has been switched on (top picture, Item 1).

- Start engine :
1. Fault lamp goes out shortly after the engine has started: no fault stored
 2. Fault lamp flashing: evaluate flashing code.
Note: faults which occur only briefly are also stored.

HOW TO ACTIVATE THE SELF-DIAGNOSIS

Start engine and operate briefly at $> 3000 \text{ min}^{-1}$. Then idle. Depending on fault, fault lamp will flash 2 to 6 times. Using the self-diagnosis test table it is possible to evaluate the flashing code and to rectify the fault.

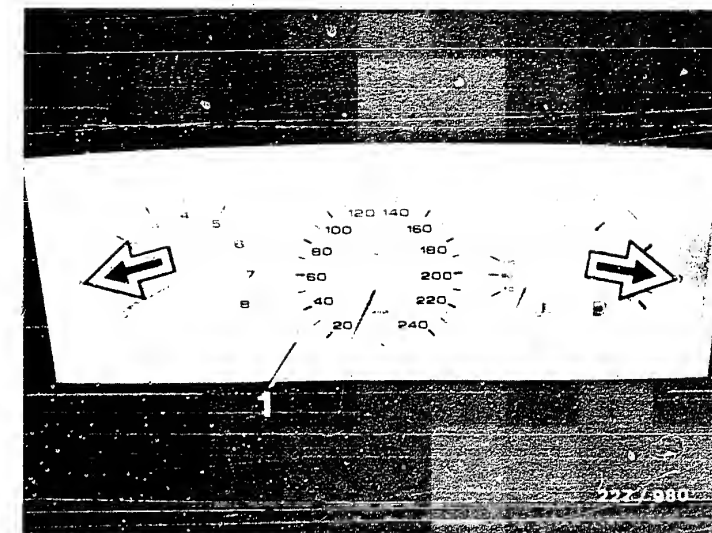
Activation of the self-diagnosis with subsequent fault rectification must be repeated until the fault lamp no longer flashes (knock control is then O.K.).

Evaluation of flashing code

The flashing code consists of flashing pulses of the fault lamp, see bottom picture. Between the flashing pulses there is a long pause of approx. 3 seconds. The bottom picture shows flashing code 2. The diagnosis readout including pauses is repeated until the ignition is switched off. This also erases the fault stored in the EZ-K control unit.

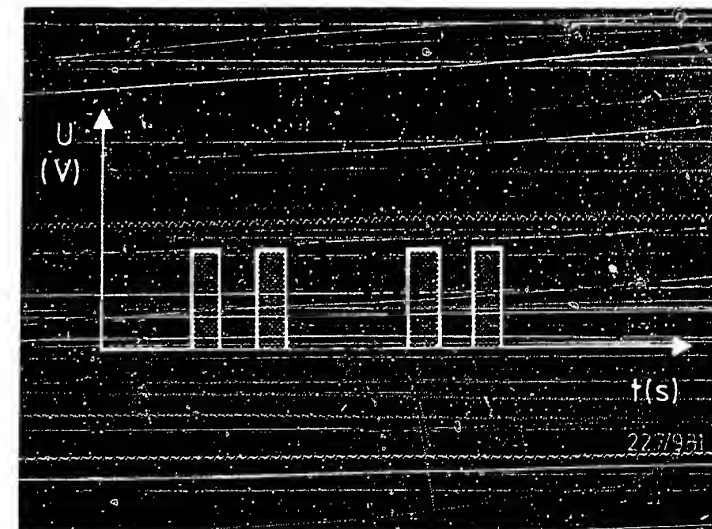
Note:

If fault lamp does not light up with "ignition ON", perform test step from Coordinate C23. Then continue activation.



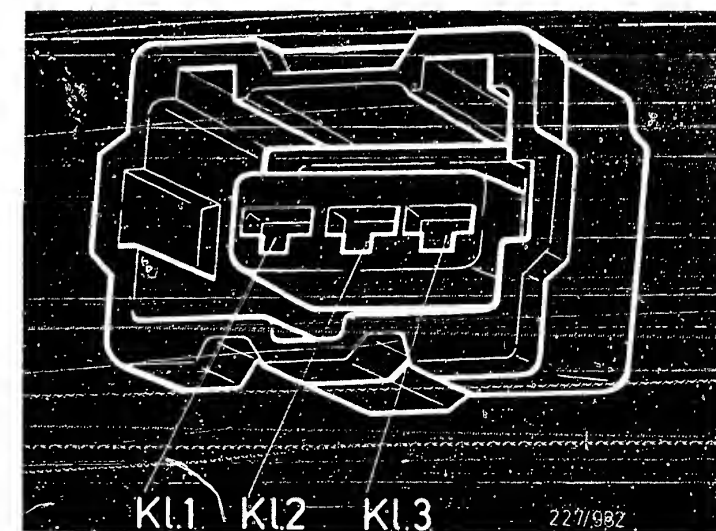
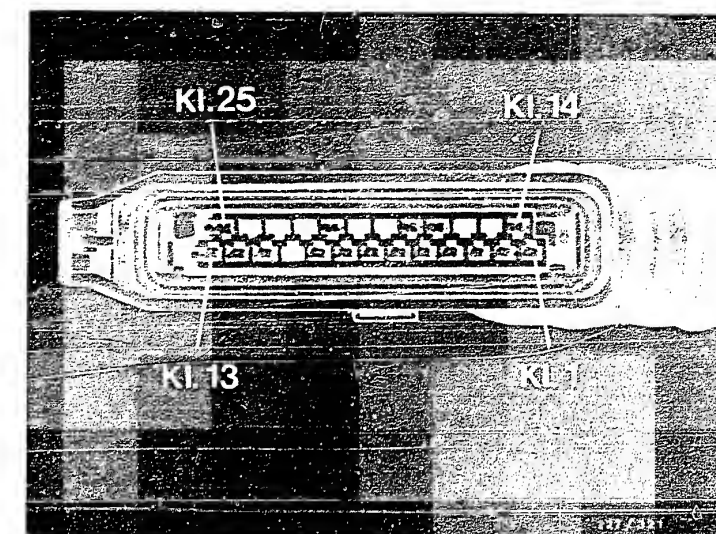
1 = Fault lamp

Note: shaded field means fault lamp "ON".



SELF-DIAGNOSIS TEST TABLE

Fault indication Flashing code	Checking of component/function Test instructions/conditions	Terms.	Set values	Coordinate
2	Coolant-temperature sensor Resistance of EZ-K control-unit plug at temperature + 20° C + 30° C + 80° C + 90° C + 100° C	2 , 20	see brief instructions	B13
4	Knock sensor defective 1. Check both knock-sensor plug- in connections for oxidation. 2. Resistance of EZ-K ctrl.-unit plug and left-hand knock-sensor plug-in connection (cyl. 1, 2, 3) 3. Resistance of EZ-K ctrl.-unit plug and right-hand knock-sensor plug-in connection (cyl. 4, 5, 6) 4. Resistance of EZ-K control- unit plug	 13 , 1 12 , 2 25 , 1 24 , 2 25 , 24 13 , 12	 approx. 0 Ω approx. 0 Ω infinity Ω infinity Ω	B15
5	LH-Jetronic load signal Resistance of EZ-K control-unit plug and LH-Jetronic control-unit plug Voltage of EZ-K control-unit plug with handle cover removed	 8 , 24 8 , 20 (+) (-)	 approx. 0 Ω see brief instructions	B19
6	Cylinder-recognition pickup Resistance of EZ-K control-unit plug Resistance of EZ-K control-unit plug	 18 , 19 19 , 21	 see brief instructions infinity Ω	B23



SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (1)

Flashing code 2 check coolant-temperature sensor.

N>

Switch off ignition. Disconnect EZ-K control-unit plug. Connect ohmmeter to term. 2 and term. 20. See top picture.

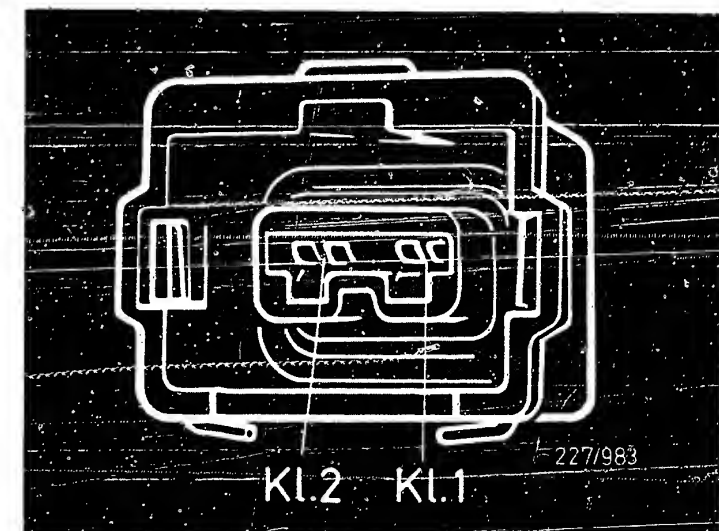
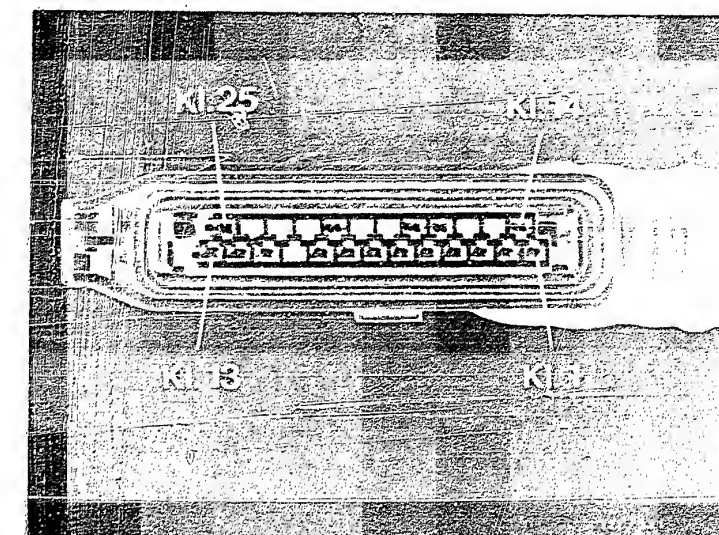
See brief instructions for resistance set values.

Resistance values O.K. at stated temperature?

Disconnect temperature-sensor plug. See bottom picture.

Check for open circuit in lead (white cable) from EZ-K control-unit plug term. 2 to temperature-sensor plug term. 2. Eliminate open circuit.

If there was no open circuit, replace coolant-temperature sensor.



Return to self-diagnosis B11

B13

B14

SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (2)

Flashing code 4 check knock sensor.

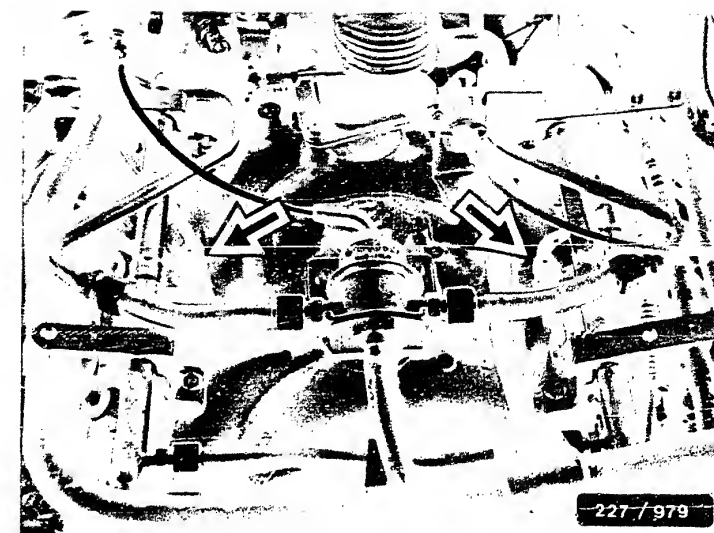
Visual inspection

Take apart both knock-sensor plug-in connections.
Check contacts of plug and socket (top picture, arrows) for oxidation.

Visual inspection O.K.?

N>

Eliminate oxidation.



227/979

Switch off ignition.
Disconnect EZ-K control-unit plug.

Connect ohmmeter to:

1. Knock-sensor plug-in connection, left	EZ-K control-unit plug
Term. 2	Term. 12
Term. 1	Term. 13

Set value: approx. 0 Ω
(continuity)

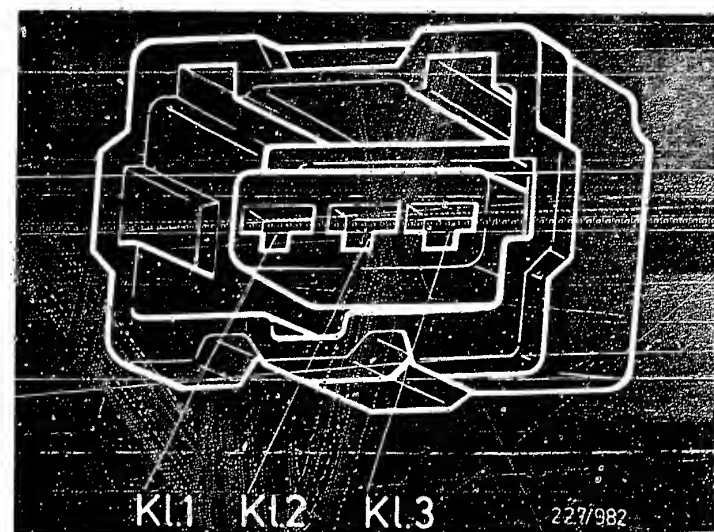
2. Knock-sensor plug-in connection, right	EZ-K control-unit plug
Term. 2	Term. 24
Term. 1	Term. 25

Sollwert approx. 0 Ω
(continuity)

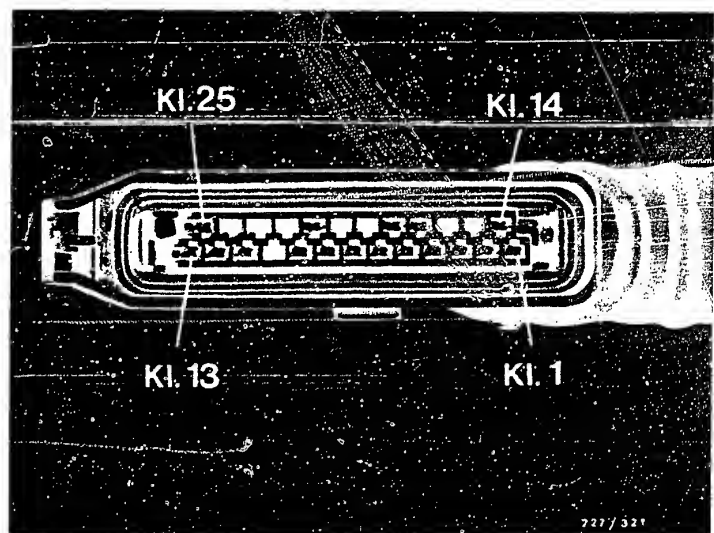
Set values obtained for test points 1 and 2?

N>

Eliminate open circuit in respective lead.



227/982



227/321

Continued on next picture page

SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (2) CONTINUED (1)

Connect ohmmeter
to:

1. EZ-K control-unit plug
term. 12 and term. 13

Set value: infinity Ω (open
circuit)

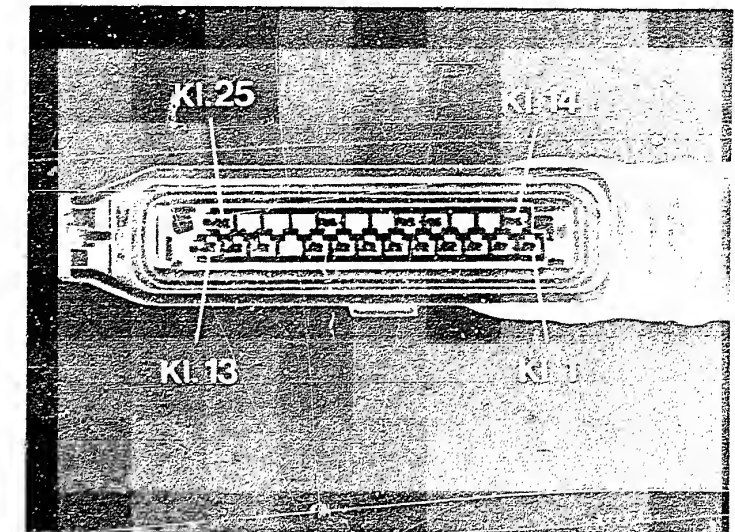
2. EZ-K control-unit plug
term. 24 and term. 25

Set value: infinity Ω (open
circuit).

Set values obtained for test
points 1 and 2?

N>

If ohmmeter shows approx. 0 Ω
(continuity) for test point 1 or
2, eliminate short circuit to
ground in respective knock-sensor
lead.



Replace both knock sensors.
(Note tightening torque, see
brief instructions)

Activate self-diagnosis.
"Old" knock sensors are defective
if fault lamp now no longer
indicates flashing code 4.

Self-diagnosis O.K.?

N>

Replace EZ-K control unit.
"Old" knock sensors must not
be re-installed.

Return to self-diagnosis B11

SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (3)

Flashing code 5 check LH-Jetronic
load signal.

Switch off ignition. Disconnect
plugs from EZ-K and LH-Jetronic
control units.

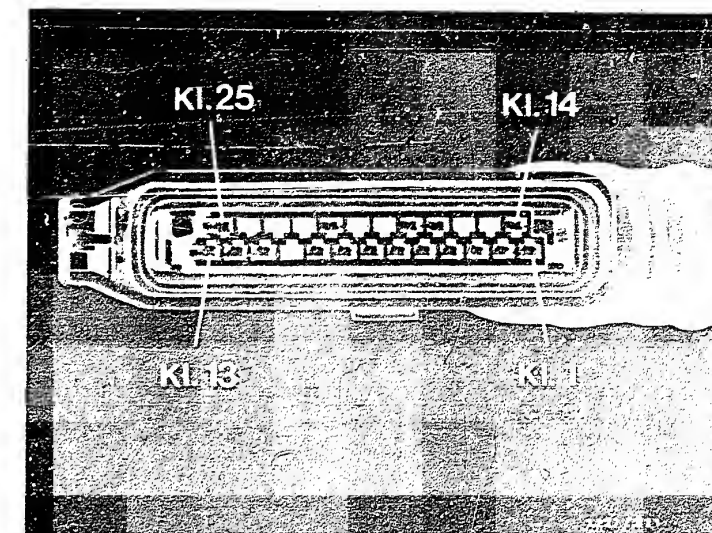
Connect ohmmeter to:

EZ-K control- unit plug	LH-Jetronic control-unit plug
Term. 8	Term. 24

Ohmmeter must indicate approx.
0 Ω (continuity).
Resistance value O.K.?

N>

Eliminate open circuit.



Continued on next picture page

SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (3) CONTINUED (1)

V

Connect LH-Jetronic control-unit plug.

Push back EZ-K control-unit plug handle cover after unscrewing fastening screw and taking off rubber gasket.

Connect EZ-K control-unit plug, connect voltmeter to term. 8 (+) and term. 20 (-). Let engine idle.

See brief instructions for voltage set value.

Voltage value O.K.?

N>

Check LH-Jetronic.



V

Return to self-diagnosis B11

B21

<=>

B22

<=>

SELF-DIAGNOSIS TROUBLE-SHOOTING PROGRAM (4)

Flashing code 6 check cylinder recognition.

Disconnect EZ-K control-unit plug. Connect ohmmeter to term. 18 and term. 19.

See brief instructions for resistance set value.

Resistance value O.K.?

N>

Take apart inductive pickup plug-in connection.
Connect ohmmeter consecutively to:

EZ-K control-unit plug	Pulse-generator plug
Term. 18	Term. 2
Term. 19	Term. 3

Ohmmeter must indicate approx. 0 Ω .
Eliminate open circuits.

Connect ohmmeter to EZ-K control-unit plug term. 19 and term. 21.

See brief instructions for resistance set value.

Resistance value O.K.?

N>

Take apart pulse-generator plug-in connection.
Repeat test.
If set value now obtained, replace pulse generator.
Otherwise, eliminate short circuit in lead.

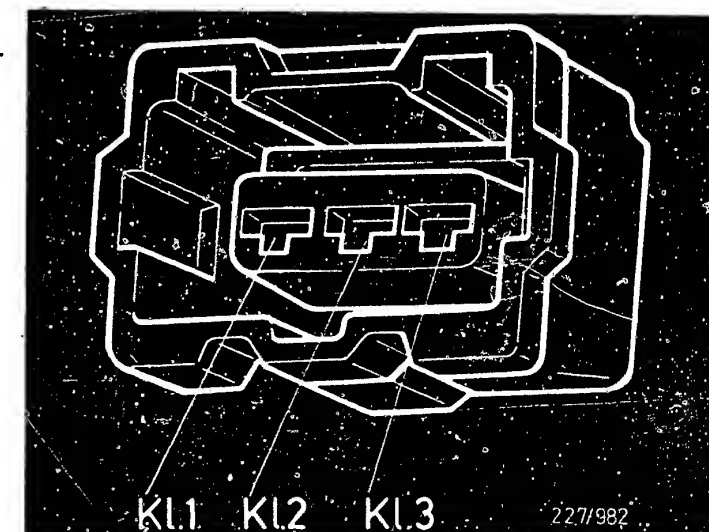
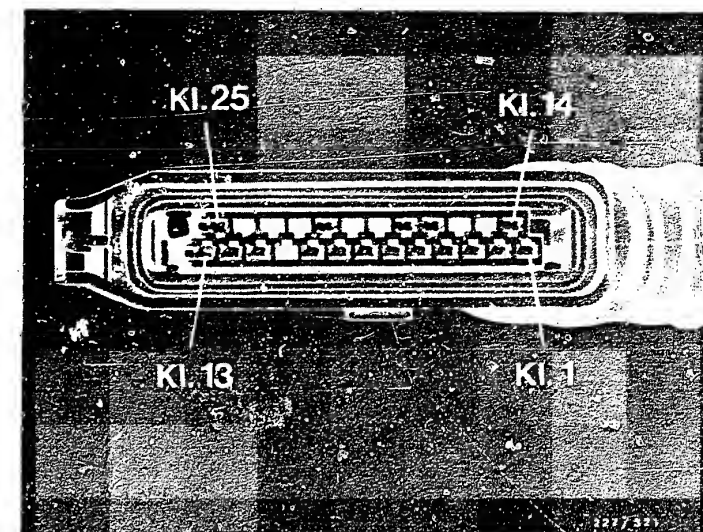
Replace induction-type pickup. Activate self-diagnosis.
"Old" induction-type pickup is defective if flashing code 6 is no longer indicated.

Self-diagnosis O.K.?

N>

Re-install old induction-type pickup.
Replace EZ-K control unit.

Return to self-diagnosis B11



TROUBLE-SHOOTING PROGRAM (1)

V

Test HIGH-VOLTAGE SIDE:

Test spark plugs, spark-plug connectors, interference-suppression resistors, ignition cables, distributor cap, distributor rotor etc. for proper functioning (e.g. open circuits, shunt). Evaluate, for example, using ignition oscillogram, resistance measurement, and visual inspection.

Is the high-voltage side OK?

N>

Repair high-voltage side.

Y

V

Return to trouble-shooting chart B04

B25

==>

B26

<==>

TROUBLE-SHOOTING PROGRAM (2)

V

Check IGNITION COIL.

Visual inspection:

Plug (see picture) in position
and no sealing compound escaped?

Electrical test:

Primary resistance at term. 1
and term. 15
(Take resistance of test leads
and test prods into account)

Secondary resistance at term. 1
and term. 4
See brief instructions for
resistance values.

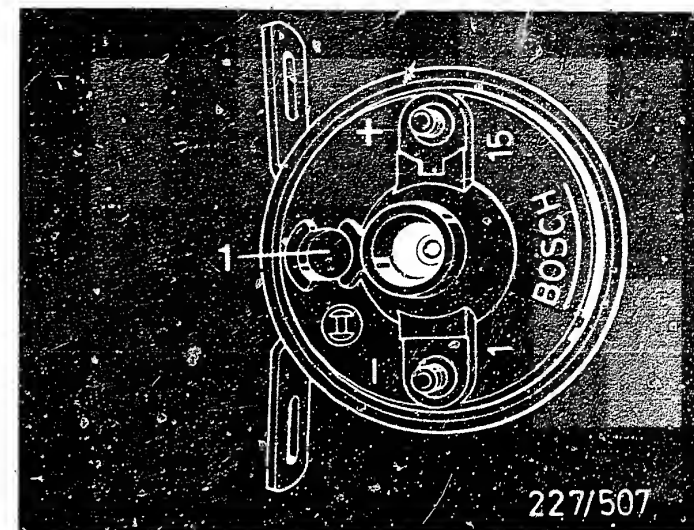
Plug in position and/or no
sealing compound escaped?

Resistance values O.K.?

N>

1.If plug not in position and/or
sealing compound escaped, replace
ignition coil and trigger box.

2.If resistance values not O.K.,
replace ignition coil.



1 = Plug

V

Return to trouble-shooting chart
B04

TROUBLE-SHOOTING PROGRAM (3)

Check TRIGGER-BOX POWER SUPPLY.

Disconnect trigger-box plug and connect voltmeter to term. 4 (+) and term. 2 (-). Switch on ignition.

Voltmeter must indicate battery voltage.

Voltage value O.K.?

N>

Disconnect ignition power-supply relay. See bottom picture.

Switch on ignition.

1. Connect voltmeter to relay base term. 86 (+) and term. 85 (-).

Set value approx. U_B.

2. Connect relay base term. 30 and both term. 87 with auxiliary lead (jumper). Connect voltmeter to vehicle ground and, consecutively, to relay base term. 30, both term. 87 and trigger-box plug term. 4.

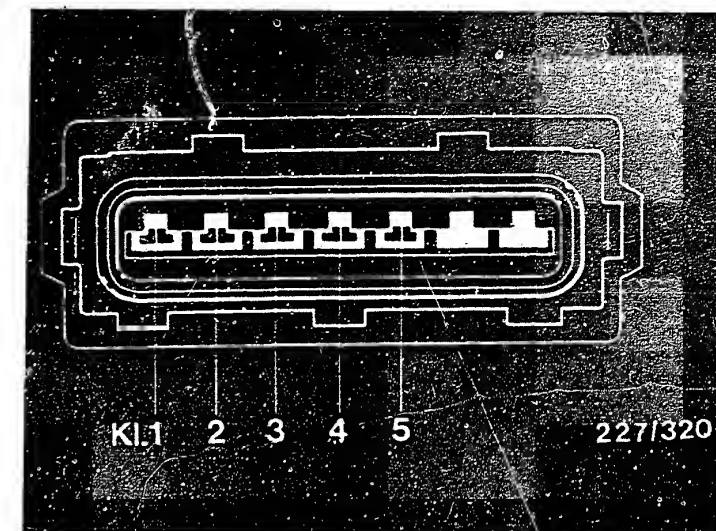
Set value approx. U_B.

3. Connect voltmeter to trigger-box plug term. 2 (-) and positive battery terminal.

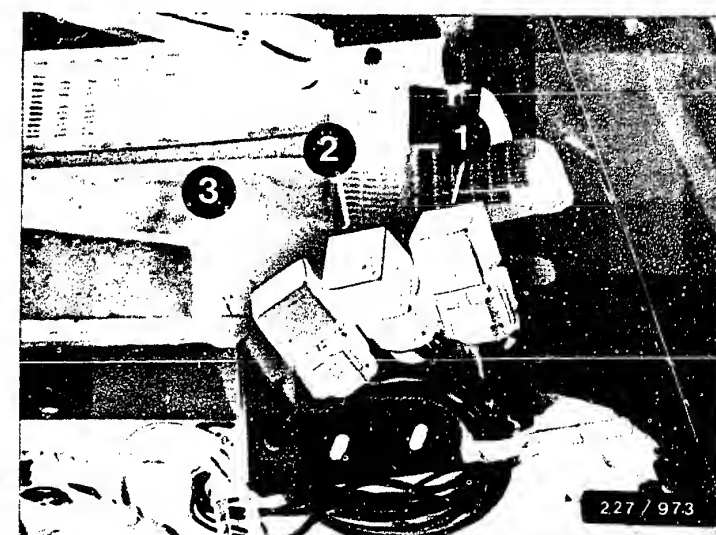
Set value approx. U_B.

If set values not obtained, eliminate open circuits in leads.

If there was no open circuit, replace ignition power-supply relay.



1 = Ignition power-supply relay
2 = LH-Jetronic main relay
3 = Fuel-pump relay



Return to trouble-shooting chart B04

C01

<=>

C02

<=>

TROUBLE-SHOOTING PROGRAM (4)

Check PRIMARY CIRCUIT.

Disconnect trigger-box plug and connect voltmeter to term. 1 (+) and term. 2 (-), see picture.

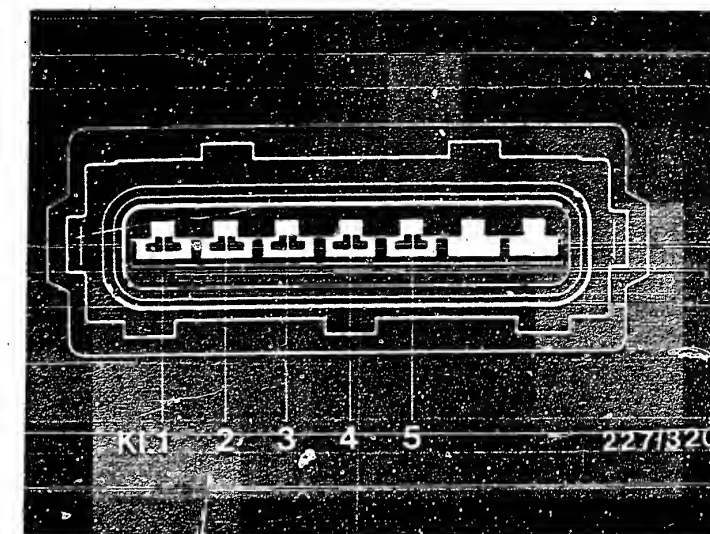
Switch on ignition.

The voltmeter must indicate battery voltage.

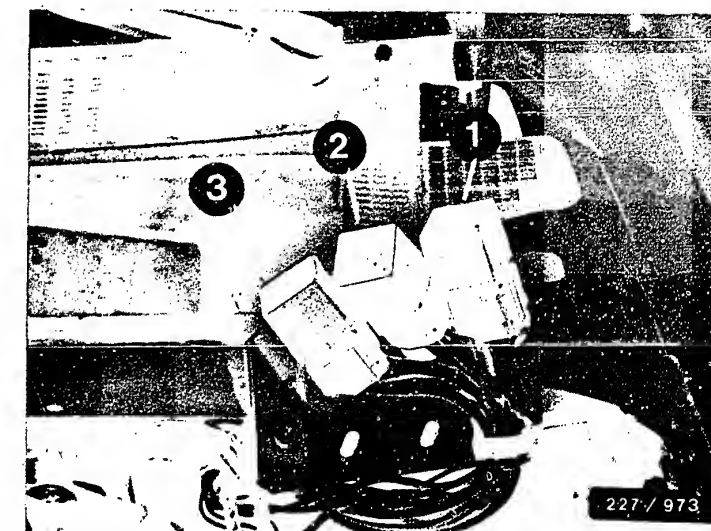
Voltage value O.K.?

N>

Check for open circuit in lead from ignition power-supply relay term. 87 (see bottom picture) to ignition coil term. 15, in primary winding of ignition coil as well as in lead from ignition coil term. 1 to trigger-box plug term. 1. Eliminate open circuit.



- 1 = Ignition power-supply relay
- 2 = LH-Jetronic main relay
- 3 = Fuel-pump relay



Return to trouble-shooting chart B04

TROUBLE-SHOOTING PROGRAM (5)

Check power supply to
EZ-K control unit.

Disconnect EZ-K control-unit
plug and connect voltmeter to
term. 6 (+) and term. 20 (-).
See top picture.
Switch on ignition.
Voltmeter must indicate battery
voltage.

Voltage value O.K.?

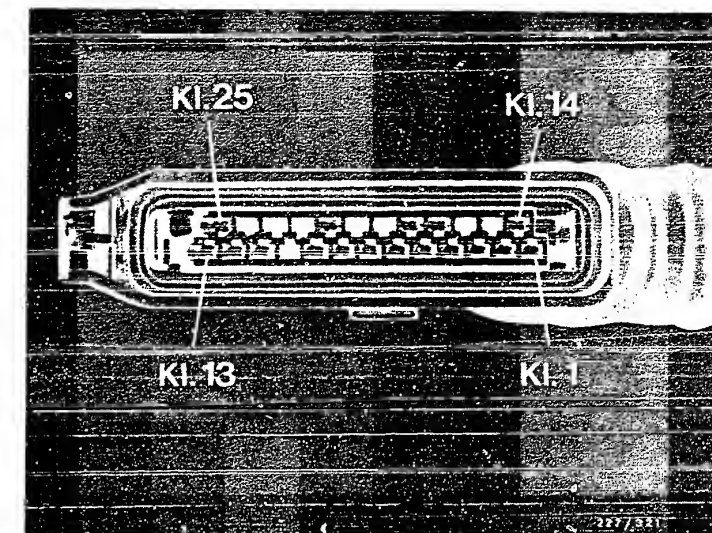
N>

Switch off ignition.
Connect ohmmeter consecutively
to:

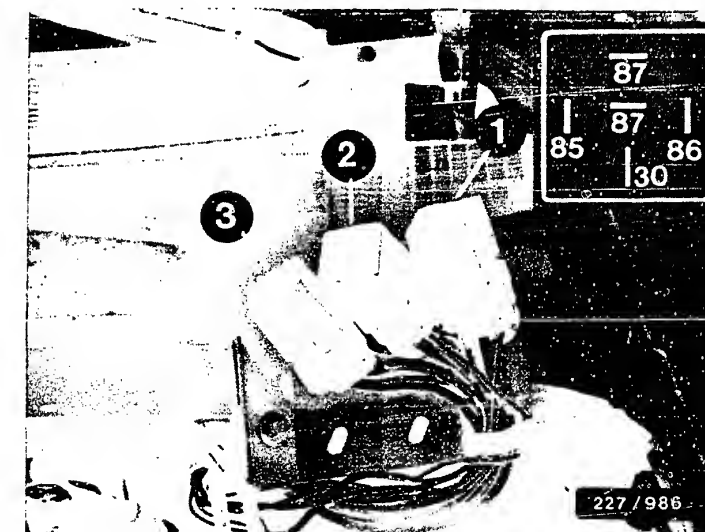
1. Power-supply relay base
term. 87 and EZ-K control-unit
plug term. 6

2. EZ-K control-unit plug
term. 20 and vehicle ground

Ohmmeter must indicate approx.
0 Ω (continuity) in each
case.
Eliminate open circuits.
If there was no open circuit,
replace power-supply relay.



1 = Ignition power-supply relay
2 = LH-Jetronic main relay
3 = Fuel-pump relay



Return to trouble-shooting chart
B04

TROUBLE-SHOOTING PROGRAM (6)

Check winding resistance of engine-speed sensor.

Disconnect EZ-K control-unit plug and connect ohmmeter to term. 10 and term. 23.

See brief instructions for resistance set value.

Resistance value O.K.?

N>

Check engine-speed sensor plug-in connection (damage, oxidation), see top picture, arrow.
Connect ohmmeter consecutively to:

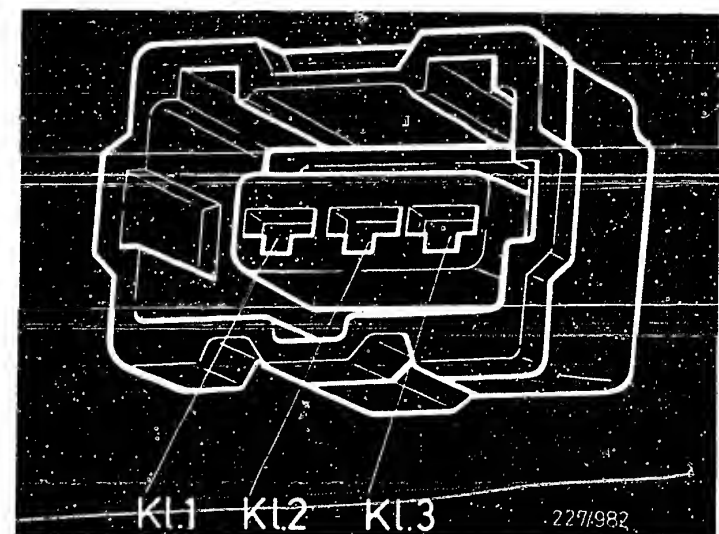
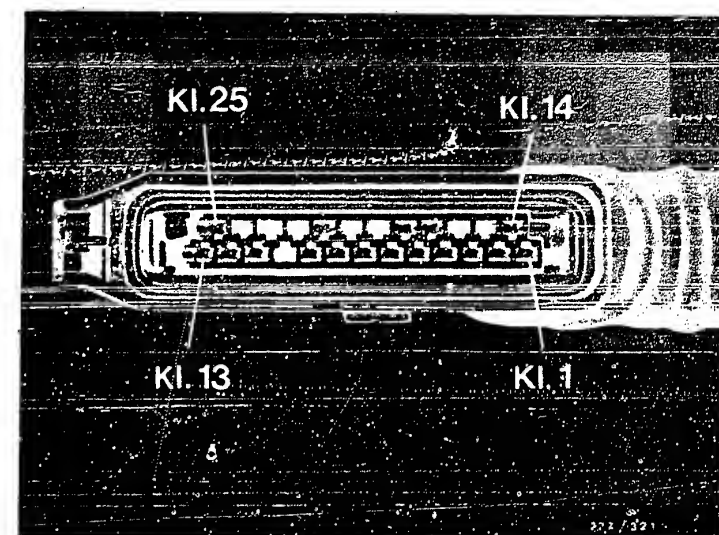
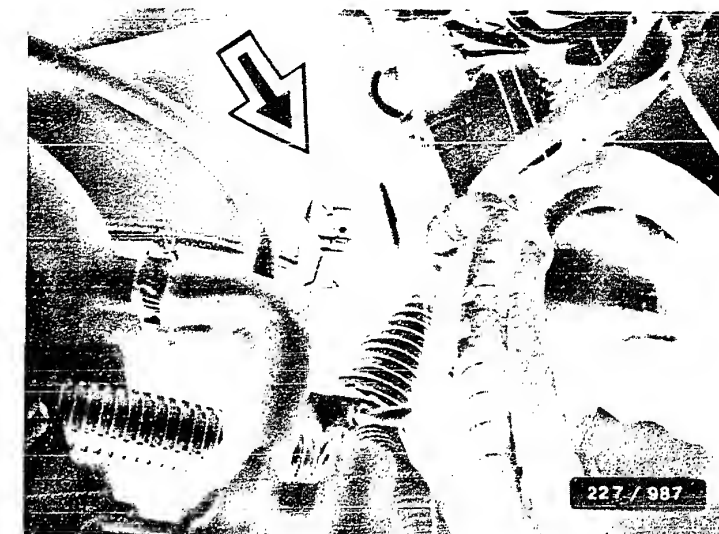
EZ-K control-unit plug	Plug of engine-speed sensor
Term. 10 and Term. 23	Term. 1 and Term. 2

Term. 10 and Term. 1
Term. 23 and Term. 2

Ohmmeter must indicate approx. 0 Ω (continuity).

Eliminate open circuits.

If there was no open circuit, replace engine-speed sensor.



Continued on next picture page

TROUBLE-SHOOTING PROGRAM (6) (CONTINUED)

Check insulation resistance
of engine-speed sensor.

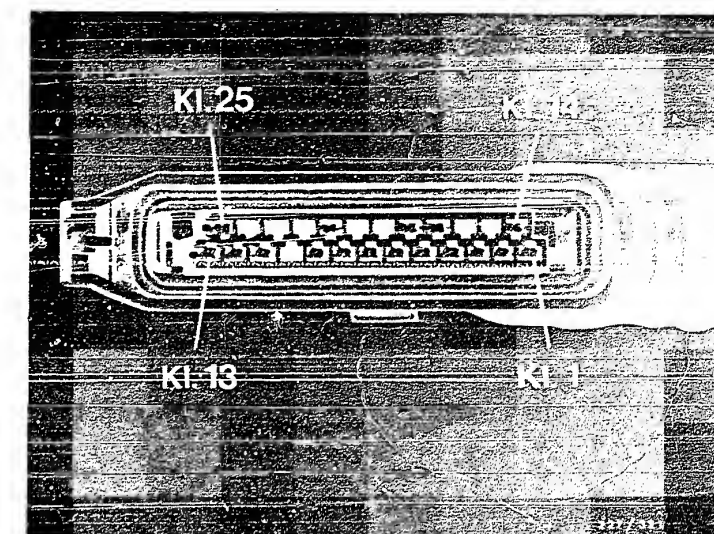
Connect ohmmeter to EZ-K
control-unit plug term. 11
and term. 23, see picture.

The ohmmeter must indicate
infinity Ω .

Resistance value O.K.?

N>

Take apart engine-speed sensor
plug-in connection.
If resistance value now O.K.,
replace engine-speed sensor.
If resistance not O.K., eliminate
short circuit in lead.



Continued on next picture page

TROUBLE-SHOOTING PROGRAM (6) (CONTINUED)

V

Check operation of engine-speed sensor.

Connect oscilloscope according to operating instructions with program switch in "special" position.

For example MOT 201:

Connect red and black clamps to EZ control-unit plug term. 10 (-) and term. 23 (+).

Start engine.

Measured-signal voltage must be at least 2.5 V, see bottom picture.

Engine-speed signal (voltage)
O.K.?

N>

Replace engine-speed sensor.

Y

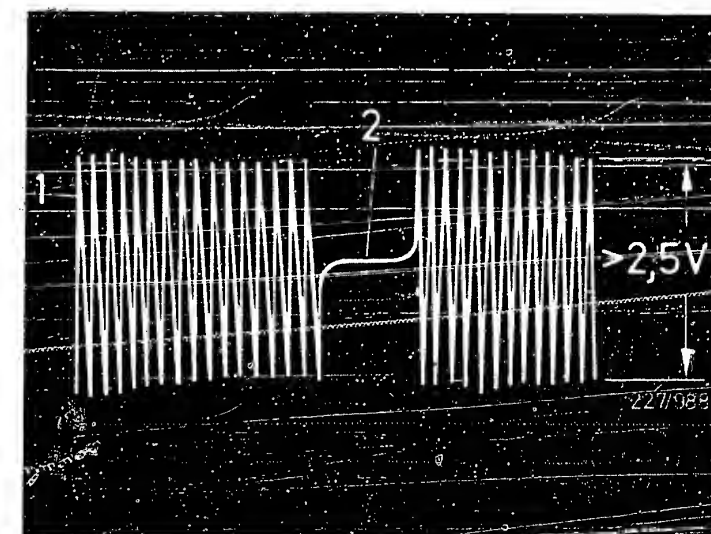
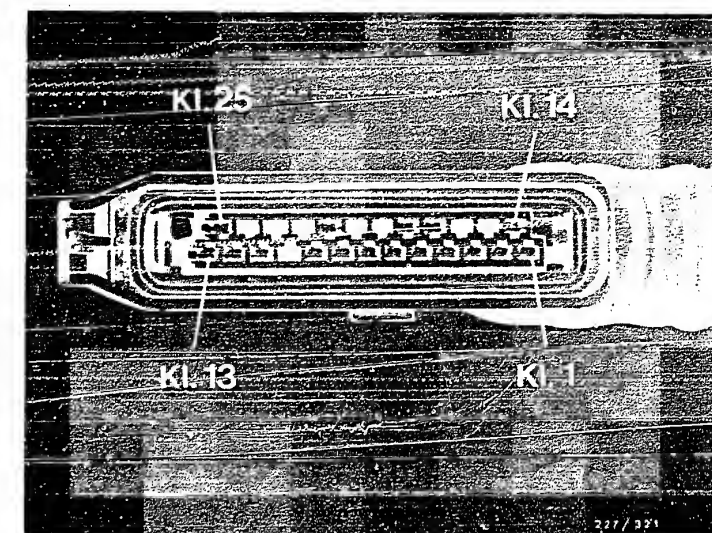
Return to trouble-shooting chart
B04

C11

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C12

<=>



TROUBLE-SHOOTING PROGRAM (7)

Check operation of EZ-K control unit

Disconnect trigger-box plug and connect oscilloscope according to operating instructions with program switch in "special" position.

For example MOT 201:
Connect red clamp to trigger-box plug term. 5 and black clamp to vehicle ground.

Start engine.
Oscilloscope must indicate a rectangular signal, see bottom picture.

Signal O.K.?

N>

Switch off ignition. Disconnect EZ-K control-unit plug. Connect ohmmeter to:

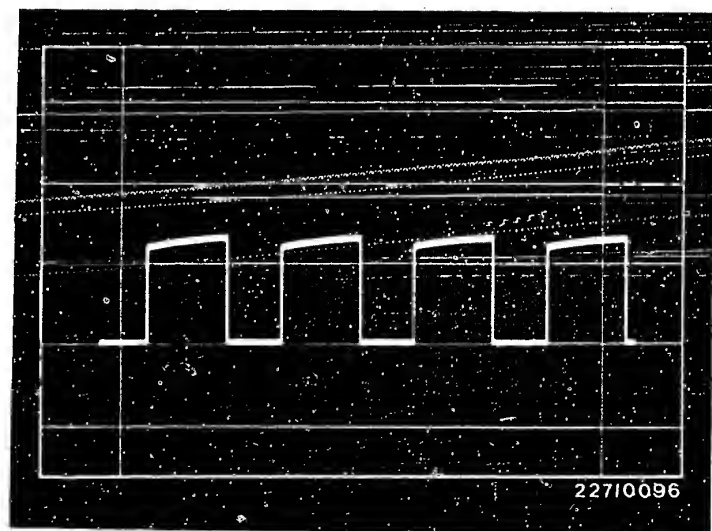
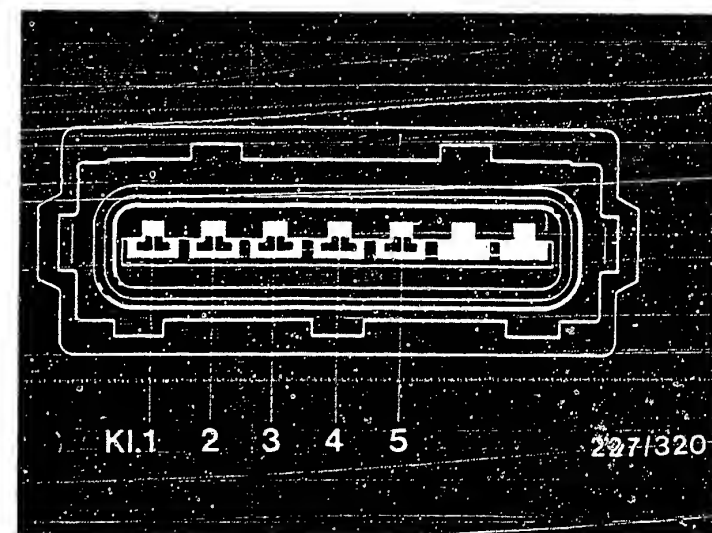
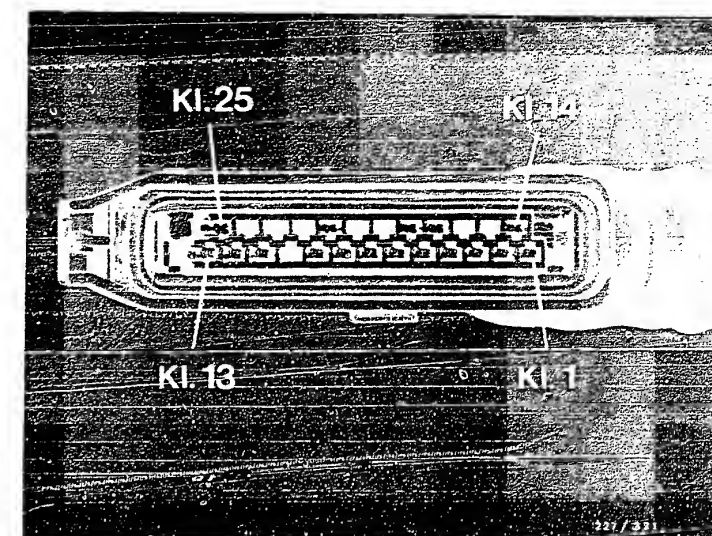
EZ-K control-unit plug	Trigger-box plug
------------------------	------------------

Term. 16	Term. 5
----------	---------

Ohmmeter must indicate approx. 0 Ω (continuity).

Eliminate open circuit.

If there was no open circuit, replace EZ-K control unit.



Return to trouble-shooting chart B04

TROUBLE-SHOOTING PROGRAM (8)

Check engine-speed signal for LH-Jetronic

Disconnect LH-Jetronic control-unit plug. Connect oscilloscope according to operating instructions with program switch in "special" position.

For example MOT 201:
Red clamp to LH-Jetronic control-unit plug term. 1,
black clamp to vehicle ground.
Start engine.
Oscilloscope must indicate a rectangular signal, see picture.

Signal O.K.?

N>

Switch off ignition. Disconnect EZ-K control-unit plug. Connect ohmmeter to:

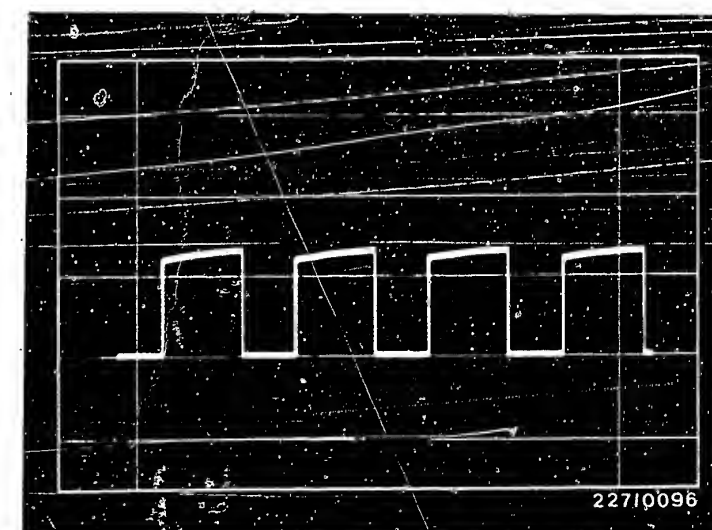
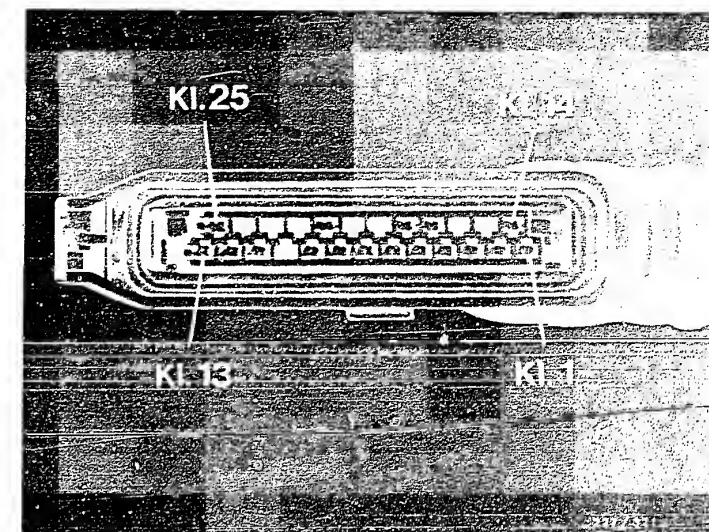
EZ-K control-unit plug	LH-Jetronic control-unit plug
Term. 17	Term. 1

Term. 17

Term. 1

Ohmmeter must indicate approx. 0 Ω (continuity).
Eliminate open circuit.

If there was no open circuit, replace EZ-K control unit.



Return to trouble-shooting chart B04

TROUBLE-SHOOTING PROGRAM (9)

V

Check contact resistances.

Disconnect negative and positive leads from battery. Disconnect trigger-box plug. Disconnect ignition power-supply relay and jump term. 30 and both term. 87 with auxiliary lead.

Switch on ignition.
Check the following leads for contact resistance:

- 1.From positive battery terminal to trigger-box plug term. 4
- 2.From negative battery terminal to trigger-box plug term. 2
- 3.From positive battery terminal to ignition coil term. 15
- 4.From ignition coil term. 1 to trigger box term. 1

Contact resistance when testing points 1 to 4 max. 0.3 Ω
(take resistance of test leads/ test lead into account).

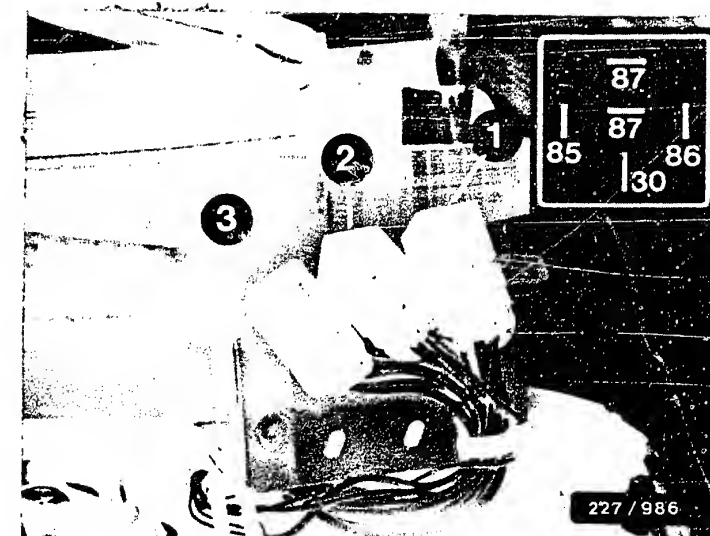
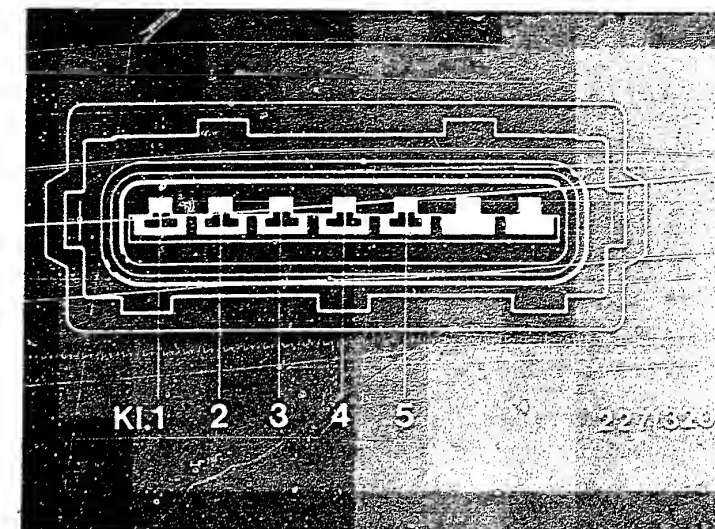
Resistance values O.K.?

V

Return to trouble-shooting chart B04

N>

Eliminate contact resistances.



TROUBLE-SHOOTING PROGRAM (10)

Check idle throttle-valve switch

Disconnect EZ-K control-unit plug. Connect ohmmeter to term. 7 and term. 20.
Throttle valve in idle position.
Ohmmeter must indicate approx. 0 Ω (continuity).

Resistance value O.K.?

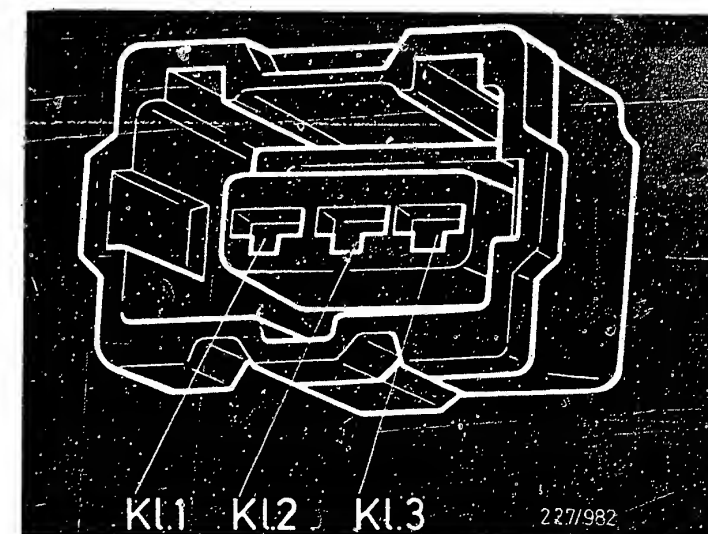
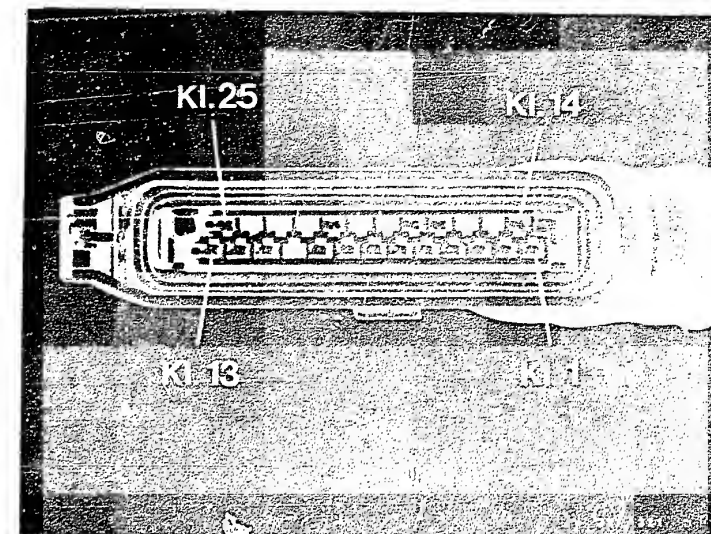
N>

Disconnect throttle-valve switch plug. Connect ohmmeter to:

EZ-K control-unit plug	Throttle-valve switch plug
Term. 7	Term. 1

Ohmmeter must indicate approx. 0 Ω (continuity).
Eliminate open circuits.

If there was no open circuit, adjust/replace throttle-valve switch.



Continued on next picture page

TROUBLE-SHOOTING PROGRAM (10) (CONTINUED)

V

Check full-load throttle-valve switch.

N>

Disconnect EZ-K control-unit plug. Connect ohmmeter to term. 4 and term. 20. Open throttle valve fully.

Ohmmeter must indicate approx. 0 Ω (continuity).

Resistance value O.K.?

V

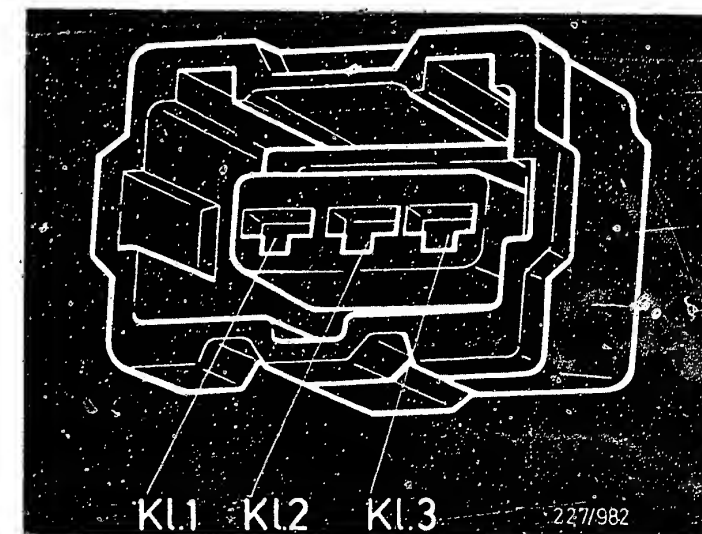
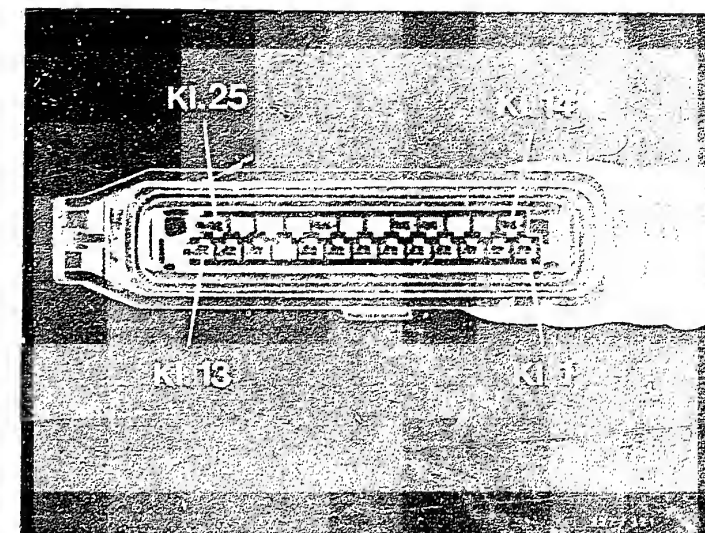
Return to trouble-shooting chart B04

Disconnect throttle-valve switch plug. Connect ohmmeter to:

EZ-K control-unit plug	Throttle-valve switch plug
Term. 4	Term. 3

Ohmmeter must indicate approx. 0 Ω (continuity). Eliminate open circuits.

If there was no open circuit, replace throttle-valve switch.



TROUBLE-SHOOTING PROGRAM (11)

V

Check fault lamp.

Switch on ignition (do not start engine).
Fault lamp in instrument panel must light up.

Fault lamp lit?

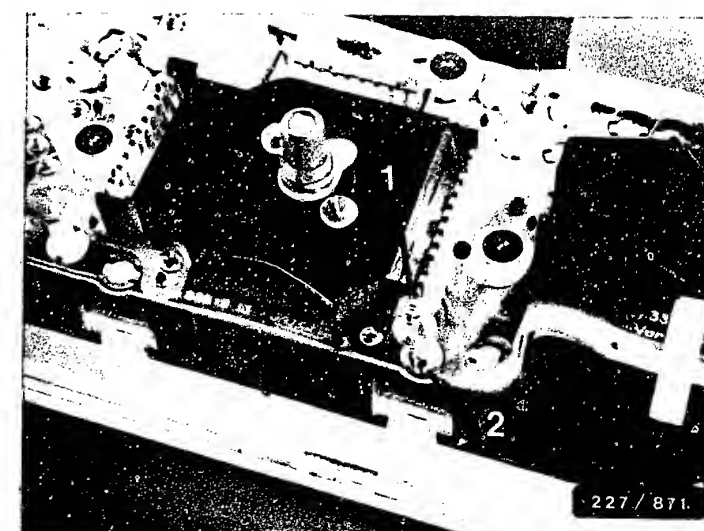
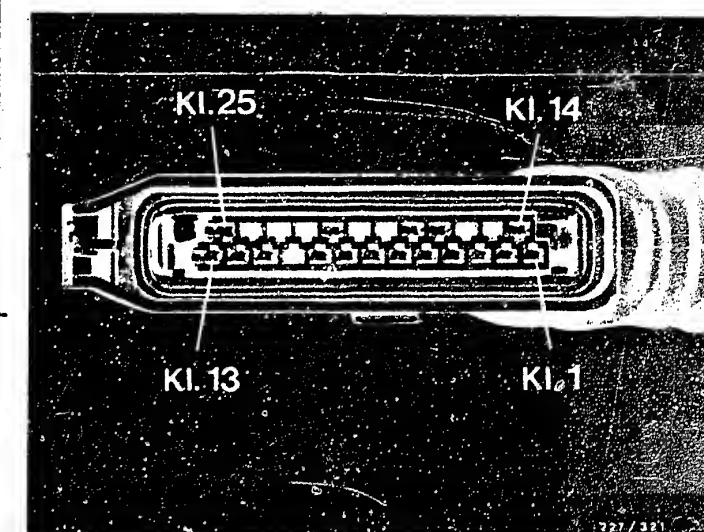
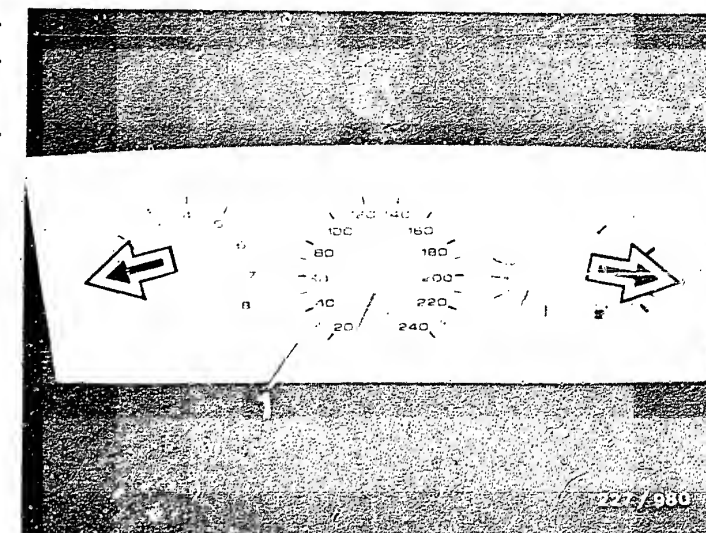
N>

Switch off ignition. Disconnect EZ-K control-unit plug and connect term. 3 to vehicle ground with auxiliary lead.

Switch on ignition.
If fault lamp now lit, replace EZ-K control unit.

If fault lamp not lit, remove instrument panel, connect voltmeter to fault lamp positive term. and negative term. Switch on ignition. Voltmeter must indicate approx. U_B . If no voltage indicated, check power-supply lead for open circuit.

If voltage value O.K., replace fault lamp.



Continued on next picture page

TROUBLE-SHOOTING PROGRAM (11) (CONTINUED)

Start engine and run at
idle.

Fault lamp goes out or may flash.

Fault lamp functioning correctly?

N>

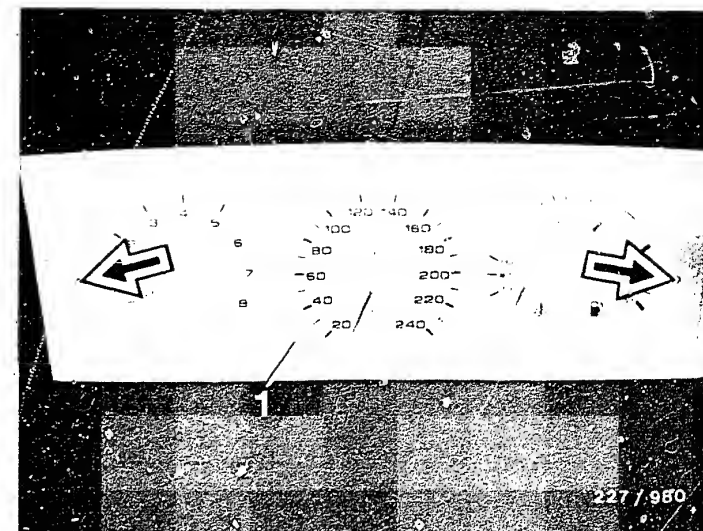
Switch off ignition. Disconnect
EZ-K control-unit plug.

Switch on ignition.

If fault lamp now goes out,
replace EZ-K control unit.

If fault lamp still lit,
connecting lead term. 3 or fault
lamp has short circuit to ground.

Eliminate short circuit to ground.



Return to trouble-shooting chart
B04

TROUBLE-SHOOTING PROGRAM (12)

V

Check spark-advance angle.

(Connect series resistor if there is a clearly incorrect ind. of engine speed on testers.)

Run warmed-up engine at idle. Measure spark-advance angle (top picture).

See brief instructions for spark-advance angle set value.

Spark-advance angle O.K.?

N>

Replace EZ-K control unit.

Y

Return to trouble-shooting chart B04

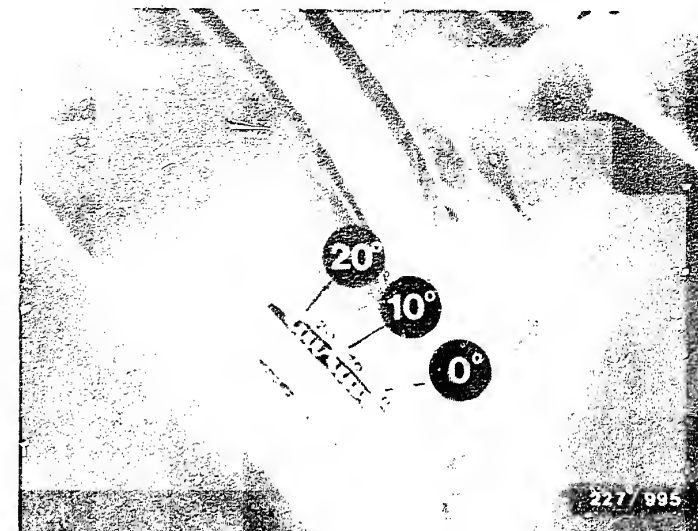
V

C27

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C28

<=>



TROUBLE-SHOOTING PROGRAM (13)

V

Check trigger-box power supply.

N>

Push back rubber sleeve on trigger-box plug. Connect voltmeter to trigger-box plug term. 4 (+) and term. 2 (-), see top picture.

Run engine at idle.

The voltage must be 12...14 V and must be no more than 1 V below battery voltage.

Voltage value O.K.?

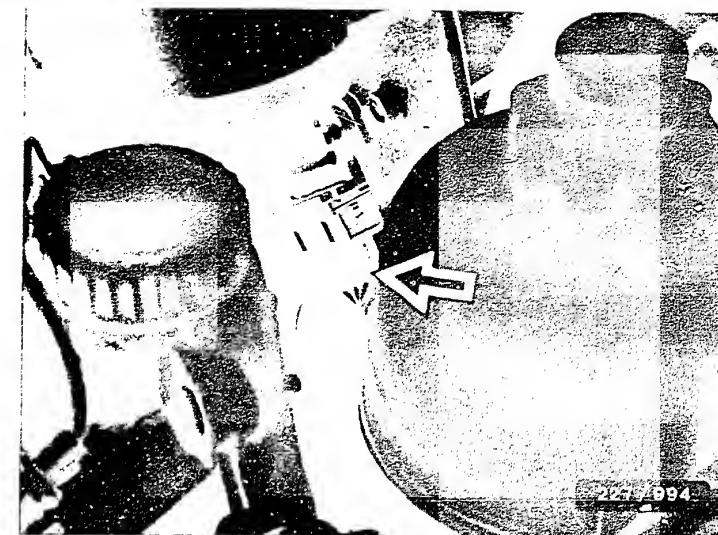
Y

Return to trouble-shooting chart B04

Start engine and run at idle.

1. Connect voltmeter (+) to positive battery terminal and trigger-box plug term. 4 (-). Voltage drop may be max. 0.5 V. Eliminate voltage drop.

2. Connect voltmeter (-) to negative battery terminal and trigger-box plug term. 2 (+). Voltage drop may be max. 0.5 V. Eliminate voltage drop.



TROUBLE-SHOOTING PROGRAM (14)

V

Check power supply to EZ-K control unit.

N>

Switch off ignition. Disconnect EZ-K control-unit plug and push back handle cover after unscrewing fastening screw and taking off rubber gasket.

Connect EZ-K control-unit plug. Connect voltmeter at term. 6 (+) and term. 20 (-). Run engine at idle.

The voltage must be 12...14 V and must be no more than 1 V below U_B.

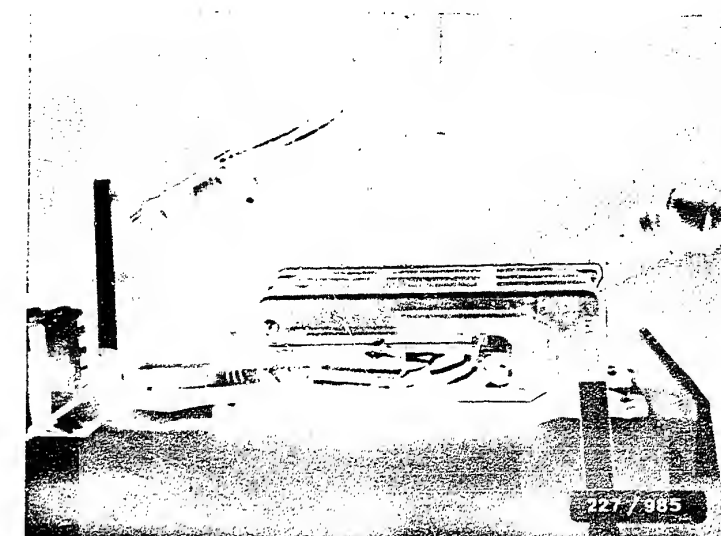
Voltage value O.K.?

Y

Start engine and run at idle.

1. Connect voltmeter (+) to positive battery terminal and EZ-K control-unit plug term. 6 (-). Voltage drop may be max. 0.5 V. Eliminate voltage drop.

2. Connect voltmeter (-) to negative battery terminal and EZ-K control-unit plug term. 20 (+). Voltage drop may be max. 0.5 V. Eliminate voltage drop.



Return to trouble-shooting chart B04

D03

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D04

<=>

TROUBLE-SHOOTING PROGRAM (15)

V

Check power supply to ignition coil.

Run engine at idle.

Measure voltage at ignition coil term. 15 and negative battery terminal.

The voltage must be at least 10 V.

Voltage value O.K.?

N>

Start engine and run at idle.

1.Connect voltmeter (+) to positive battery terminal and ignition coil term. 15 (-). Voltage drop may be max. 0.5 V. Eliminate voltage drop.

2.Connect voltmeter (-) to negative battery terminal and trigger-box plug term. 2 (+). Voltage drop may be max. 0.5 V. Eliminate voltage drop.

Y

Return to trouble-shooting chart B04

D05

<=>

D06

<=>

TROUBLE-SHOOTING PROGRAM (16)

V

Check output stage.

Connect voltmeter to ignition
coil term. 1 and term. 15.
Switch on ignition.
The voltmeter must not indicate
any deflection (0 V).
Voltage value (0 V) O.K.?

N>

Replace trigger box and
ignition coil.

V

Return to trouble-shooting chart
B04

D07

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D08

<==>

TROUBLE-SHOOTING PROGRAM (17)



Check PRIMARY VOLTAGE
(if MOT series available)

N>

Replace trigger box.

Connect oscilloscope (e.g.
MOT 201) together with pulse
shaper 1 684 463 154 to ignition
coil according to operating
instructions.

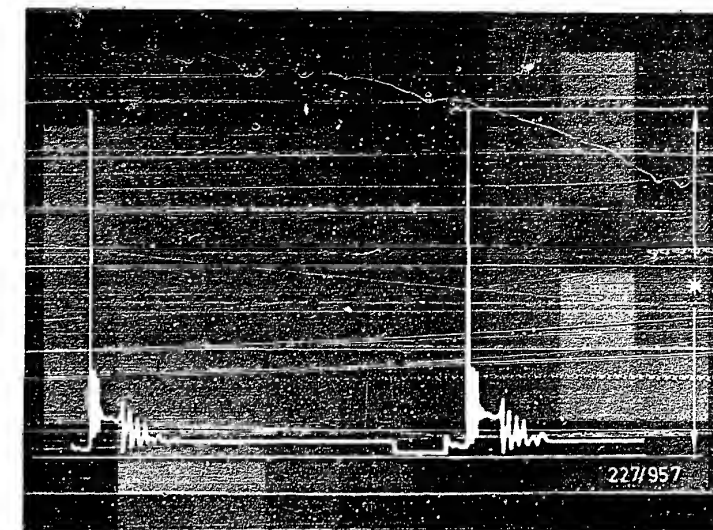
Note: incorrect reading without
pulse shaper.

See brief instructions for
primary-voltage set value.

Primary voltage O.K.?



Return to trouble-shooting chart
B04



* = See Brief Instructions

DANGER OF ACCIDENT ON SEMI-
CONDUCTOR IGNITION SYSTEMS

|22|
VDT-I-227/102 En
03.1981

Supersedes Feb. 3, 1976 edition

Please be sure to pass this bulletin together with VDE 0104/7.67 enclosed on to your employees for their attention.

The increased demands made on their ignition systems by modern engines, and the wish for freedom from maintenance, led some time ago to manufacturers starting to equip their vehicles with semi-conductor ignition systems as original equipment.

In most cases, the performance of nearly all makes of such systems is higher than that of conventional systems, and further improvements are to be expected. This means that semi-conductor ignition systems have reached the point where contact with "live" components or terminals (whether on the primary side or the secondary side) can prove fatal.

In this connection, we should like to point out to you that the laws valid in your country regarding work on high-voltage systems must be adhered to when working on, or testing, semi-conductor ignition systems.

As a matter of principle, when working on such ignition systems, the ignition is to be switched off.

Included in such work are the following operations:

- * Connection of engine testing equipment (timing strobe, dwell-tach tester, ignition oscilloscope etc.)
- * Replacement of ignition system components (spark plugs, ignition coil, ignition distributor, H.T. ignition cables etc.)

If it is necessary to switch on the ignition in order to test the system or make adjustments on the engine (to the carburetor, for instance), then lethal voltages are present throughout the entire system.

This means that the danger of accident exists not only at the individual components in the system (e.g. ignition distributor, ignition coil, trigger box, ignition harness), but also at the wiring harness (e.g. connection for the tachometer, diagnostic connector), on terminals, and on test equipment.

In addition, in the case of the capacitor-discharge ignition system (CDI), danger of accident is also present under the following circumstances:

- * Operation of the trigger box without the ignition transformer.
- * At the trigger box, (removed), relatively soon after it has been switched off (capacitor discharge).

Below is a typical terminal diagram of a semi-conductor ignition system, the dangerous locations being marked with high-voltage arrows.

We would point out that all semi-conductor ignition systems, even the older versions, are to be regarded as dangerous in the sense as defined by this bulletin.

EFFECTS OF ELECTRICAL AND ELECTRONIC SYSTEMS ON HEART PACEMAKERS

VDT-I-227/107 En
01.1981

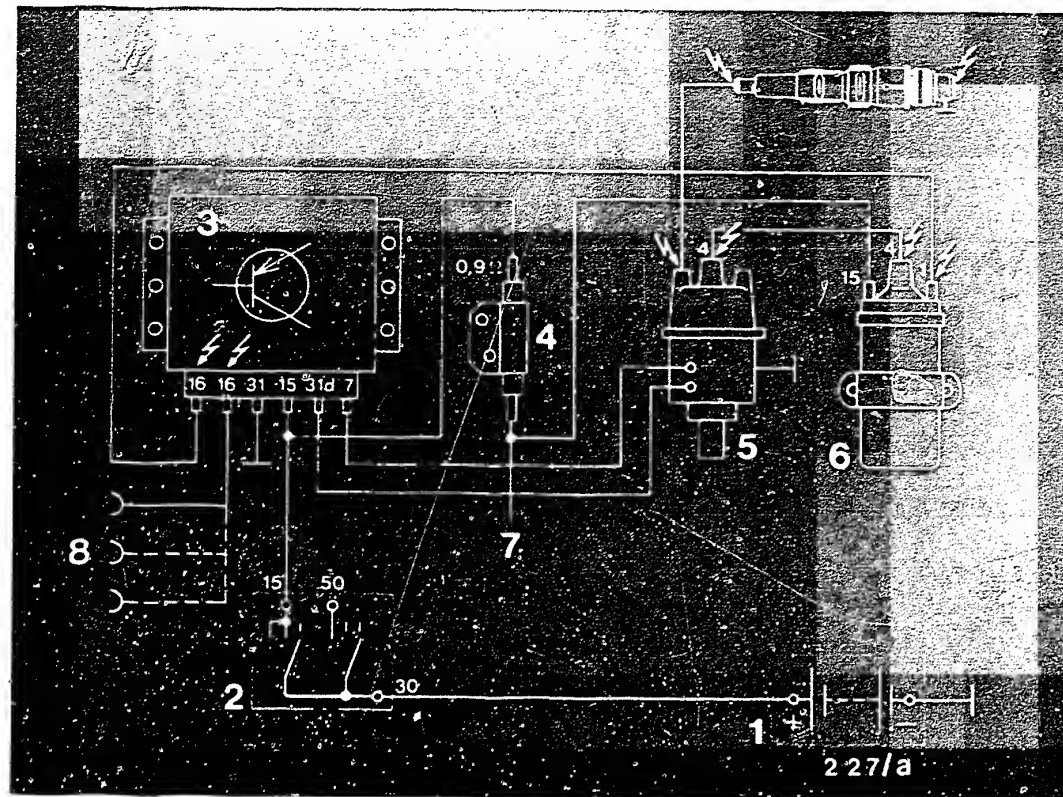
e.g. Ignition systems, Jetronic, Motronic, ABS

Please ensure that this Bulletin is passed
on to your employees for their attention.

We have often been asked by some of our
customers whether or not patients with heart
pacemakers are endangered in any way by
ignition systems. This theme was recently
the subject of an examination carried out by
the Ignition System Development Department of
Robert Bosch GmbH in conjunction with Dr.
Thull, lecturer at the Central Institute for
Biomedical Technology at the University of
Erlangen-Nürnberg and Biotronic GmbH & Co.
of Berlin, a manufacturer of heart pacemakers.
The magazine "Biomedizinischen Technik"
(5/80) published the results.

The most important discoveries in this practice
can be summarized from the examination report
as follows:

1. Heart pacemakers corresponding to the
latest state of the art are not affected
by radiation (electromagnetic fields) from
ignition systems.
2. With a stationary engine and the ignition
switched off, the heart pacemaker is not
affected by any part of the ignition system,
even when unintentionally touched. Main-
tenance work in the engine compartment, for
example, can then be carried out without
any danger.



- 1 = Battery
- 2 = Ignition lock
- 3 = Trigger box
- 4 = Resistor
- 5 = Ignition distributor
- 6 = Ignition coil
- 7 = To starting motor term. 16
- 8 = To tachometer connection
or diagnostic plug
or TD connection

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representative in your country.

3. With the engine running or stationary with the ignition switched on, touching current-carrying parts of the ignition system, as well as parts of any other electrical system, presents a certain danger for everybody. The heart pacemaker can here be affected under certain conditions (voltage, current and frequency). Patients with heart pacemakers should therefore at all costs avoid touching current-carrying parts of electrical systems.
4. Furthermore, patients with heart pacemakers are more inclined to psychic shock effects than other people, even when they receive just a harmless electric shock, because many such patients are conscious of the increased danger to the cardiac activity.

We therefore consider it inadvisable for patients with heart pacemakers to be employed in workshops or on vehicles where ignition systems are being tested or repaired. If any members of your staff have heart pacemakers, please introduce the necessary measures.

We would like to add that heart pacemakers are not expected to be affected in any way by interference from other electronic products and systems which we manufacture, such as the Antiskid System (ABS), Jetronic, Motronic, because the much greater radiation intensity of the ignition systems examined in normal use has not caused any interference to heart pacemakers corresponding to the latest state of the art.

If you should receive questions on this matter from customers, please inform them accordingly.

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KNOCK SENSOR 0 261 231 ..

VDT-I-227/110 En
03.1983

Procedures for after-sales service

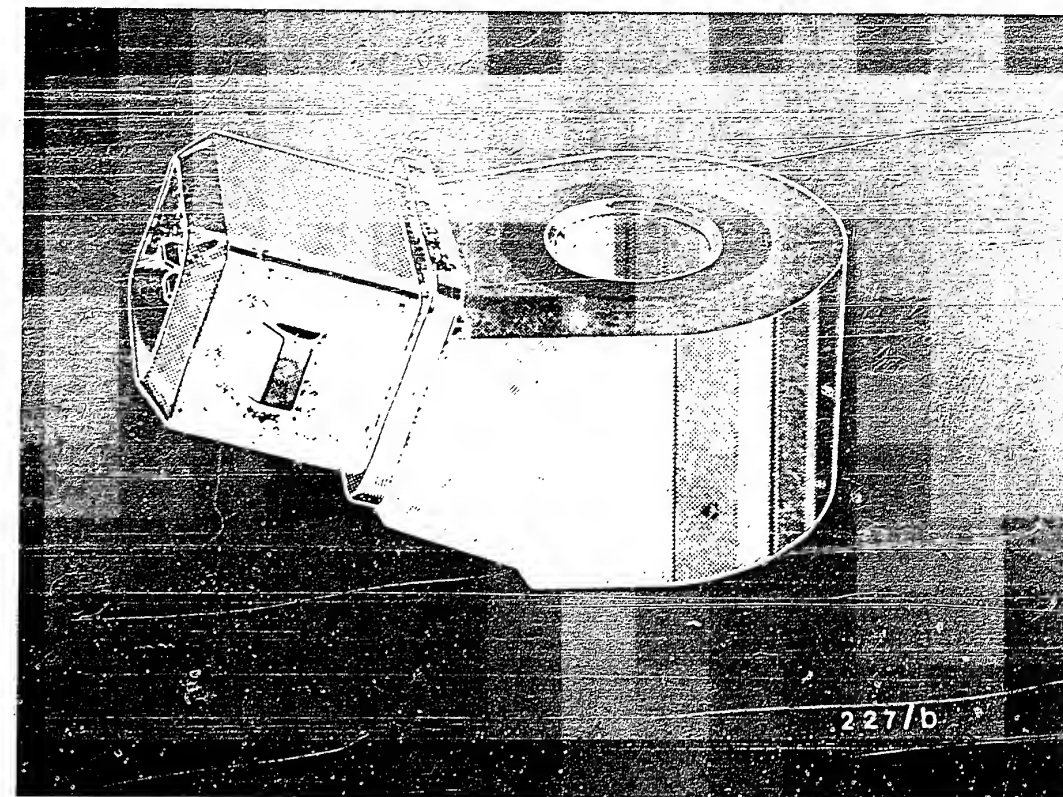
Description

The knock sensor contains an active piezo-ceramic element.

It is screwed to a chosen position on the engine block and sends a structure-borne signal which is processed further by an electronic control unit.

User

Saab is the first vehicle manufacturer to use the knock sensor which is being fitted to various turbo vehicles.



Components

Knock sensor 0 261 231 ...*

* The exact part numbers are given on the appropriate vehicle-equipment micro-cards AA... .

Service/exchange parts

The knock sensor is a service part and is supplied by Bosch.
The remaining components of the knock control are products made by other firms.

Technical documentation

Technical Bulletin "New Product"
VDT-I-227/10.

Training

Special training is not necessary.

Retrofitting

The knock sensor is not intended for retrofitting.

Warranty procedure

Components on which a claim is being made should be sent for inspection during the warranty period to our representative in your country. He should forward it to:

ROBERT BOSCH GMBH
KH7LAV-Auspackraum
zur Weiterleitung an K1/VAK2
7000 Stuttgart 30
Federal Republic of Germany

This regulation applies until further notice.

Published by:

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TECHNICAL BULLETIN

BREAKERLESS TRANSISTORIZED IGNITION SYSTEM

Warranty note

122|
VDT-I-227/103 En

Hybrid-construction trigger boxes

0 227 100 100 for ignition dist. with Hall gen. (TCI-h)

0 227 100 102 for ig. dist. with ind.-type pulse gen. (TCI-i)

Warranty procedure

If the complaints are justified, all these hybrid trigger boxes are to be sent, along with completed warranty documents, to your authorized representative for forwarding to the following address:

ROBERT BOSCH GMBH
KH/LAV - Auspackraum
zur Weiterleitung an K1/VAK 21
D-7000 Stuttgart 30

This instruction remains valid until further instruction.

TECHNICAL BULLETIN

NEW DESIGNATIONS FOR IGNITION SYSTEMS

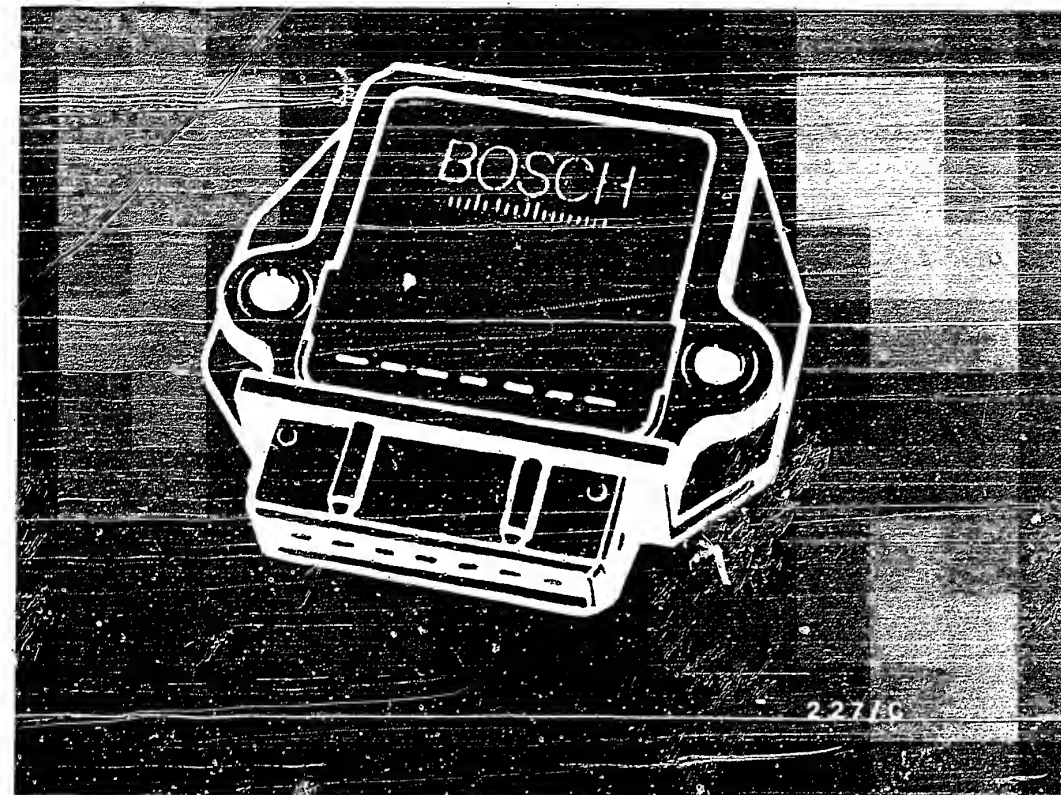
VDT-I-227/108 En
01.1983

Supersedes 5.1981 edition

The introduction of new ignition systems has made it necessary to reclassify all designations.

The designations listed below will be used immediately in KH workshop and sales literature.

Designation	Abbreviated code	Meaning	Switching	Ignition ctrl. and spark adv.	High-voltage dist.
Coil ignition	ZS (CI)		Mechanical (breaker points)	Mechanical (ignition distributor)	Mechanical (ignition distributor)
Transistorized coil ignition	TSZ-K (TCI-c)	K=breaker-triggered	Electronic (trigger box)	Mechanical (ignition distributor)	Mechanical (ignition distributor)
Trigger box with conventional circuit techniques	TSZ-I * (TCI-i)	I=Induction-type pulse gen.	Electronic (trigger box)	Mechanical (ignition dist.)	Mechanical (ignition dist.)
	TSZ-H (TCI-h)	H=Hall generator	Electronic (trigger box)	Mechanical (ignition dist.)	Mechanical (ignition dist.)



Apart from the well-known TCI trigger boxes 0 227 100 0.., trigger boxes of hybrid construction have been fitted as standard since 9.78 (upper illustration).

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Designation	Abbreviated code	Meaning	Switching	Ignition ctrl. and spark adv.	High-voltage dist.
Transistorized ignition	TZ-I * (TI-i)	I=Induction-type pulse gen.	Electronic (trigger box)	Mechanical (ignition distributor)	Mechanical (ignition distributor)
(Trigger box in hybrid technique)	TZ-H * (TI-h)	H=Hall generator	Electronic (trigger box)	Mechanical (ignition distributor)	Mechanical (ignition distributor)
Breakerless semiconductor ignition with or without knock control	EZ (EI) (EZ-K) (EI-k)	K=Knock control	Electronic (trigger box or control unit)	Electronic (control unit)	Mechanical (ignition distributor or high-voltage distributor)
Distributorless ignition with or without knock control	VZ (FEI) VZ-K (FEI-k)	K=Knock control	Electronic (control unit)	Electronic (control unit)	Electronic (dual-spark ignition coil, or 1 ignition coil for each spark plug)

* Note:

The ignition system can also be equipped with a DLS unit (digital idle stabilization) or with an ELS unit (electronic idle stabilization) or with an ESV unit (electronic ignition retardation).

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MOTOR VEHICLE SERVICE INFORMATION

INCORRECT DISPLAY OF ROTATIONAL SPEED VDT-I-Gen. 030 En
AND DWELL ANGLE ONLY WITH TRIGGER 02.1981
BOXES 0 227 100 .. (TCI-l, TCI-h)
WITH CURRENT LIMITATION Supersedes ed. 6.1980

For additional information, see VDT-I Gen. 032 En

1. General

In comparison with conventional ignition systems, transistorized ignition systems with current limitation have different primary voltage characteristics. During the dwell period, the voltage at terminal 1 of the ignition coil may assume values from 1.5 V to battery voltage (or greater). This may lead to an incorrect display of rotational speed and dwell angle when testing the ignition system. However, there is no functional defect in the ignition system, and, for this reason, the trigger box must not be replaced. Incorrect displays may occur with the testers listed below:

MOT 001.00	Rotational-speed	KTE 001.00
001.01	display O.K. with	001.02
001.02	these testers	001.03
001.04		
002.00		

By now, the following vehicles may be fitted with breakerless ignition systems with current limitation:

Audi	(Bosch/Fairchild ignition system)	Mazda	(Mitsubishi ignition system)
BMW	(Bosch ignition system)	Mitsubishi	(Mitsubishi ignition system)
Citroen	(Delco ignition system)	Nissan	(Hitachi ignition system)
Fiat	(Delco ignition system)	Datsun	(Hitachi ignition system)
		Peugeot	(Bosch ignition system)
Ford	(Delco ignition system)	VW	(Bosch/Fairchild ignition system)
General Motors	(HEI ignition system)	Bosch transistorized ignition system for retrofitting	
		0 227 100 920	

2. Test instructions

2.1 Rotational speed

Incorrect rotational-speed display can be recognized as follows:

If one starts at the idle speed and slowly increases the engine speed, then the incorrect display can be recognized by an abrupt reduction in the rotational-speed display (e.g. from 2400 min⁻¹ to 1200 min⁻¹).

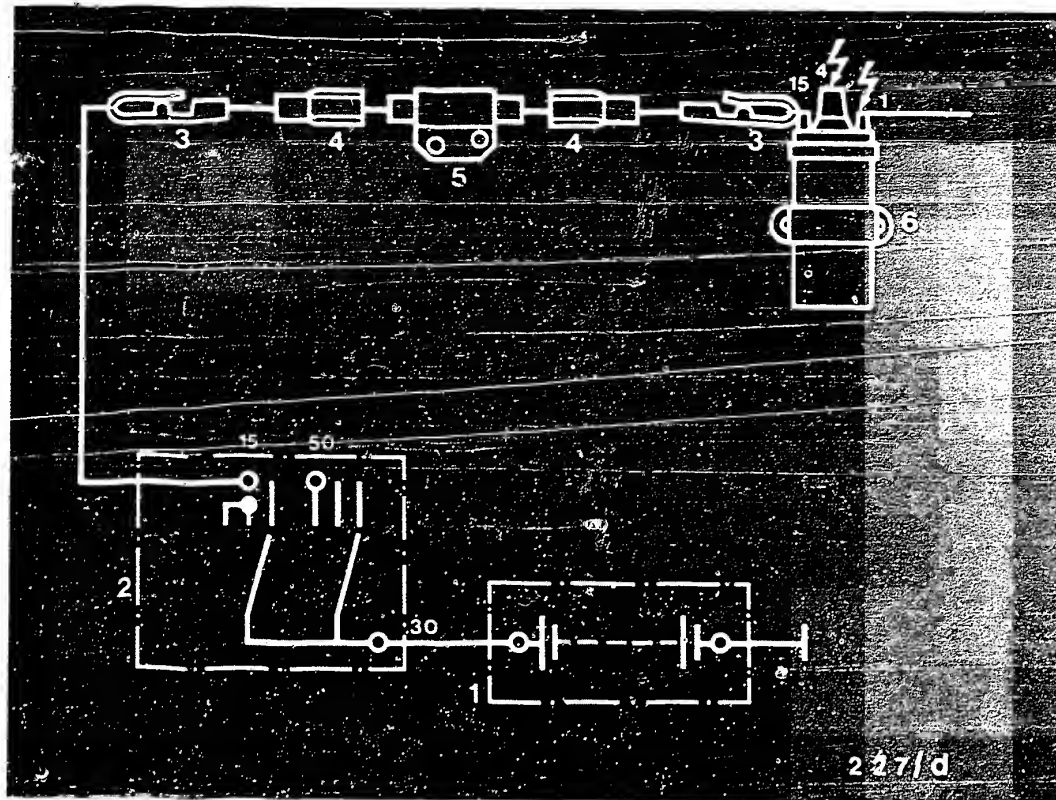
It is, however, possible to attain correct rotational-speed measurements:

Connect a ballast resistor of 0.9 or 1.0 Ohms (see Fig.) in series in the line to term. 15 of the ignition coil (take care not to cause a short circuit). After the rotational-speed measurement, the ballast resistor must be removed (otherwise starting difficulties and misfiring). Connect tester as per operating instructions.

Suggestion for user manufacture

Required parts:

1 ballast resistor 0.9 Ohms	Part no. 0 227 900 002
or	
1 ballast resistor 1.0 Ohms	Part no. 0 227 900 101
2 blade receptacles	Part no. 1 901 355 881
e.g. approx. 0.2 m cable, 1.5 mm ² e.g.	Part no. 6 210 150 150
2 insulated clips	Commercially available



- | | |
|---------------------|----------------------|
| 1 = Battery | 4 = Blade receptacle |
| 2 = Ignition switch | 5 = Ballast resistor |
| 3 = Clips | 6 = Ignition coil |

High-voltage arrow: Dangerous voltages
(400 V - 25 kV)

2.2 Dwell angle

The dwell angle is electronically controlled. A measurement of the dwell angle is no longer performed.

2.3 Ignition point

Is displayed correctly. Connect tester as per operating instructions.

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MOTOR VEHICLE SERVICE INFORMATION

MOTORTESTER CONVERSION

VDT-I-Gen. 032 En

Incorrect display of rotational speed, dwell angle and ignition point only with trigger boxes

06.1980

0 227 100 .. (TCI-l, TCI-h) with current limitation

For additional information, see

VDT-I-Gen. 030 of 6.80

Re.: Motortesters EFAW 268

268 S 10

269

214 B

AE 2000

1. General

Please make sure that the above-mentioned motortesters in your workshop and at your customers (e.g. motor-vehicle workshops, oil companies, gas stations, vocational schools etc.) are converted. The conversion is subject to payment and is carried out by the K7 after-sales service of the responsible BG. The standard time is 15 work units (with fitting of switch).

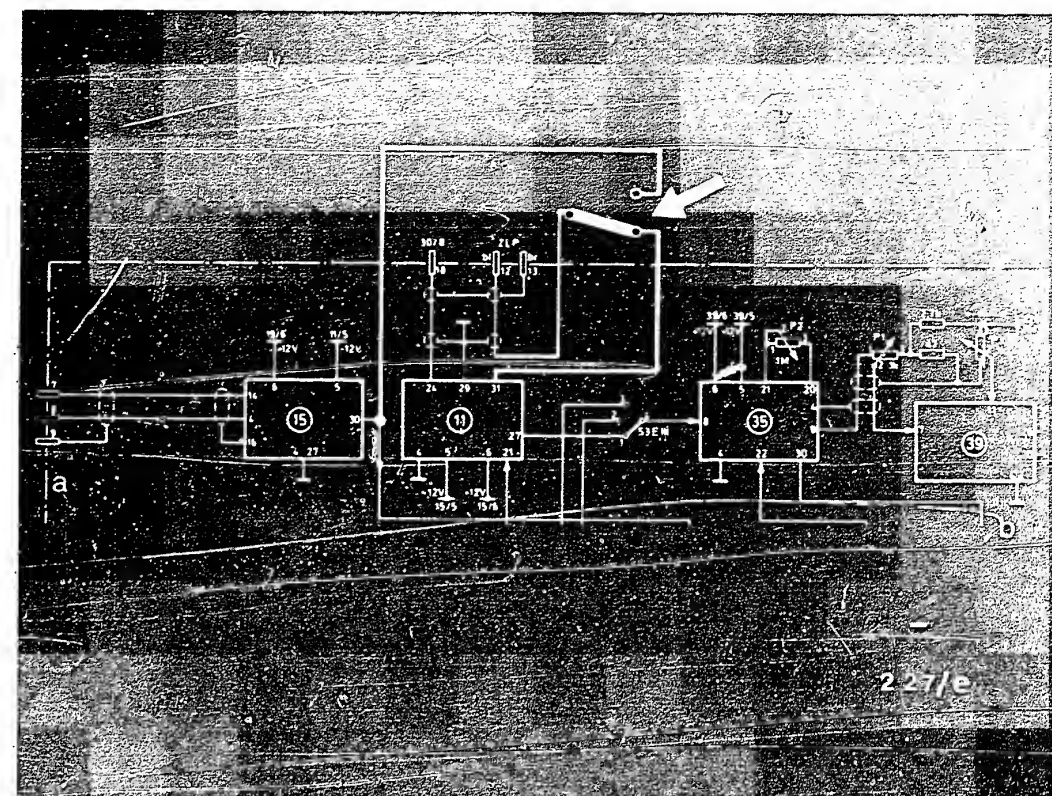
2. Why motortester conversion?

In comparison with conventional ignition systems, transistorized ignition systems with current limitation have different primary voltage characteristics. During the dwell period, the voltage at terminal 1 of the ignition coil may assume values from 1.5 V to battery voltage (or greater). This may lead to an incorrect display of rotational speed and dwell angle as well as to incorrect triggering of the meter when testing the ignition system.

There is, however, no functional defect in the ignition system, and, for this reason, the trigger box must not be replaced. Since, with the above-listed motortesters, the timing strobe is triggered by the signal-path dwell-angle meter, this incorrect triggering also leads to incorrect flashing and thus to an incorrect display of the advance angle.

3. Conversion measures

The situation is to be remedied by modifying the wiring of the testers so that the timing strobe is triggered by the clamp-on induction pickup and the pulse shaper stage.



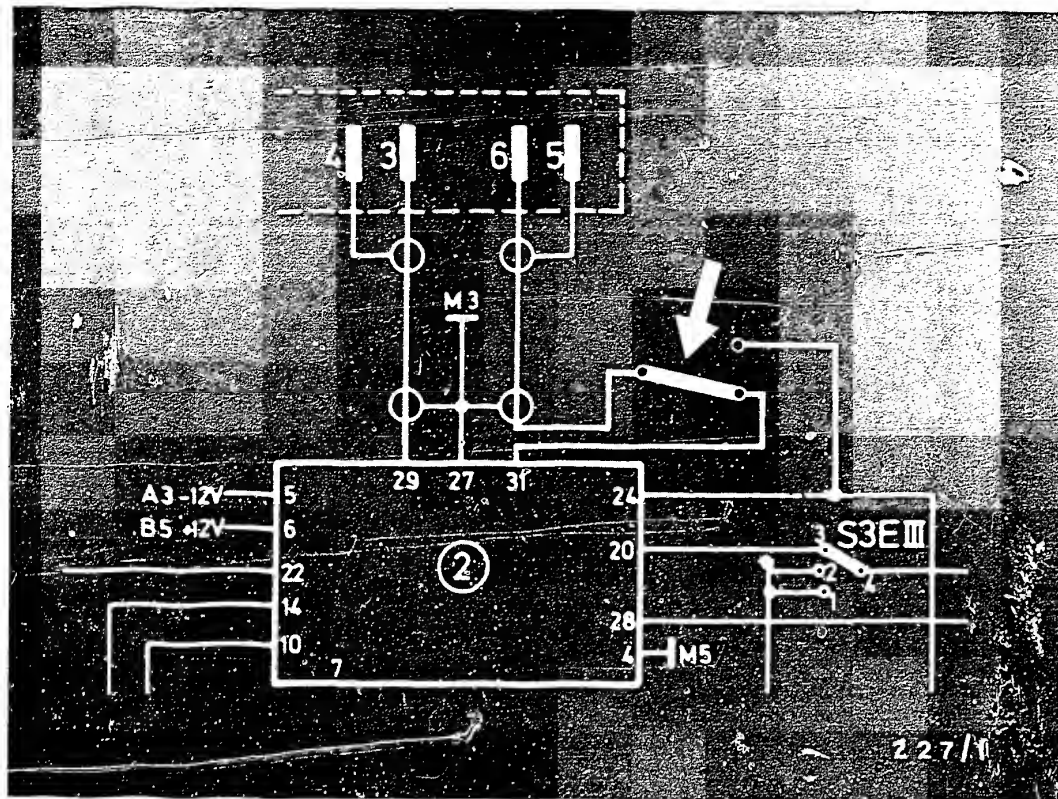
a = Clamp-on induction pickup
b = (Extract from WJF 508/1, Page 53)

EFAW 268, 268 S 10, 269, AE 2000

Remove the line of the ZLP from pin 31 of printed board 11 (coupling stage) and connect to pin 30 of printed board 15 (pulse shaper stage) via a switch with change-over contact (e.g. 0 341 500 803).

In addition, a new line must be connected from pin 31 of printed board 11 to the other contact of the switch with change-over contact.

Arrow points to switch with change-over contact.



(Extract from WJF 503/1, Page 64))

EFAW 214 B

Remove the line from terminal 6 of printed board 16 to pin 31 of printed board 2 (coupling stage) and connect to pin 24 of the same printed board via a switch with change-over contact (e.g. 0 341 500 803).

In addition, a new line must be connected from pin 31 of printed board 2 to the other contact of the switch with change-over contact.

Arrow points to switch with change-over contact.

By fitting the switch with change-over contact in the front panel of the motortester, it is possible to switch over from standard ignition systems to those with current limitation. We recommend that the switch positions be marked correspondingly:

e.g. "Standard" – "Current limitation". These conversion measures have already been published in the K7 information sheet KJF 28/7911.

4. Test instructions

4.1 Standard ignition systems

Switch position: "Standard".

All other tester connections as per operating instructions.

4.2 Ignition systems with current limitation

Switch position: "Current limitation".

In order to trigger the timing strobe, the induction-type pulse generator (clamp-on pickup or red pickup) must always be connected during the measurement.

The selector switch for ignition systems built into the motortester must be switched to standard coil ignition (not to TCI) with these ignition systems.

All other tester connections as per operating instructions.

The dwell angle is electronically controlled. A measurement of the dwell angle is no longer performed.

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MOTOR VEHICLE SERVICE INFORMATION

TESTS ON ELECTRONIC IGNITION
SYSTEMS (TCI, TI)
TESTER INSTRUCTIONS

VDT-I-Gen. 035 En
03.1981

The following tests are listed in older
and current Tester operating instructions
or in "Trouble-shooting with the oscilloscope":

- * "Separate ignition coil test"
(Concerns EFAW 213, 214, 268, AE 2000)
- * Calculating the "ignition voltage reserve"
(Concerns EFAW 213, 214, 268, AE 2000
and MOT series).
- * "Intensified insulation test"
(Concerns EFAW 213, 214, 268, AE 2000
and MOT series).

Nowadays, transistorized ignition systems
deliver more than 30,000 V secondary voltage.

To avoid damage to ignition coil, ignition
cable and ignition distributor by voltage
flashovers, the tests listed above should
n o t be carried out on transistorized
ignition systems.

The contents of this Service Information has
already been published in the K7 Information
K7-VJF 17/8012.

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For production reasons:
continued on the following
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IMPRESSUM

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